STEEL

The

Metalworking Weekly

SEPTEMBER 26, 1960

A PENTON PUBLICATION

32 Hour Week Tops USW 'Must' List

Plasmajets Offer Greater Materials Versatility in Cladding Metals

Tool Steels Ride the Business Trend

How to Make New Markets for Steel

" . . . show designers how they can use it," believes U. S. Steel Corp. A furniture component developed for its "show them" program is held by Richard F. Sentner, executive vice president-commercial. For other areas being explored, see Page 106.

MATERIALS EFFICIENCY

How to Get Higher Reliability

No. 20 in STEEL's Program for Management

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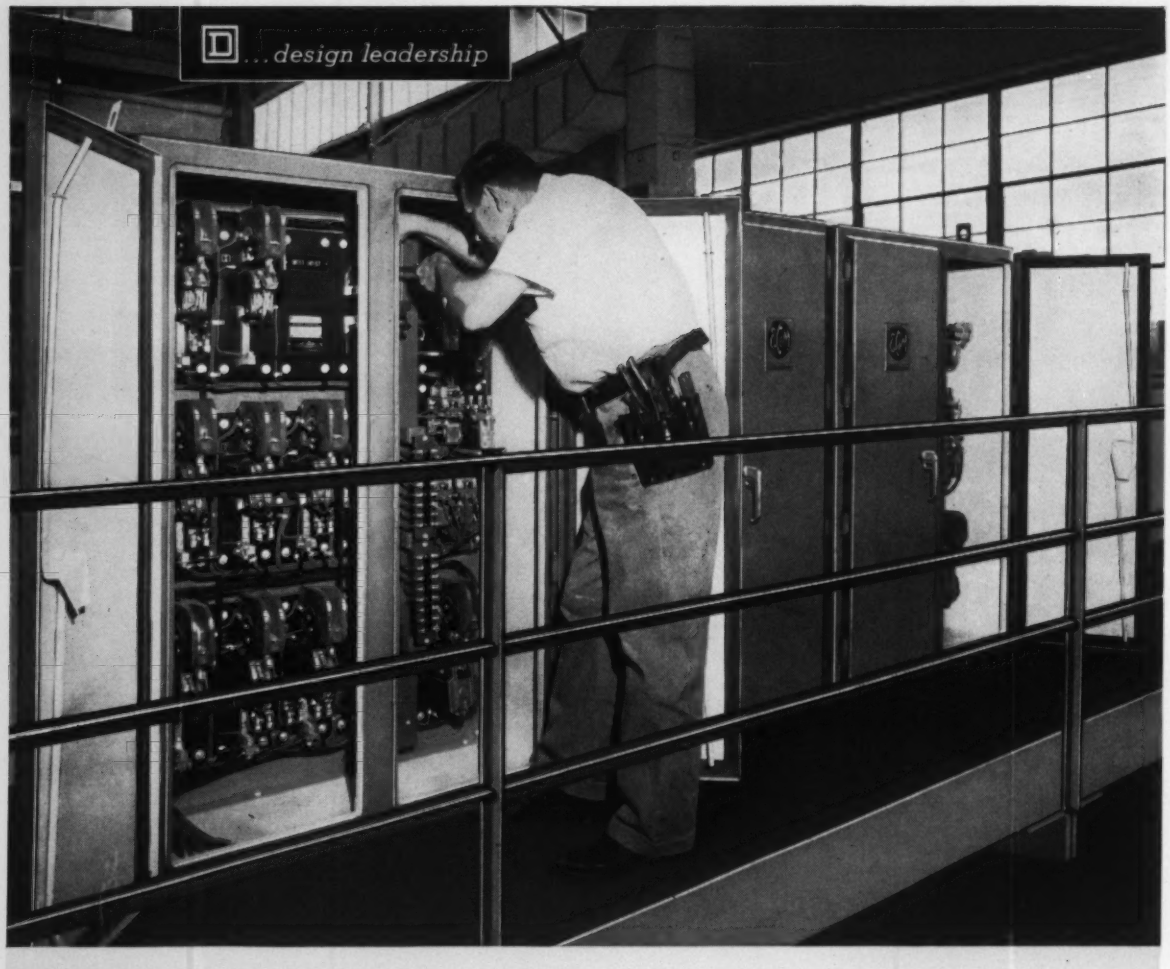

NEW! EC&M Front-Connected DC Control reduces catwalk width up to 20 inches

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EC&M front-connected control is available for single-motor DC drives up to 225 hp, with 2, 3 or 4 decks to suit headroom requirements. Includes exclusive Wright dynamic lowering circuit which gives maximum hook speed without danger of overspeeding.

Write for Bulletin 6121. Square D Company, EC&M Division, 4500 Lee Road, Cleveland 28, Ohio

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This Week in

STEEL The Metalworking Weekly

September 26, 1960 Vol. 147 No. 13

32 Hour Week Tops USW 'Must' List

Declining employment in the steel industry is making the short workweek more important than ever, David McDonald, United Steelworker president, told delegates at the USW convention in Atlantic City last week. You can expect his plea to be echoed by the United Auto Workers in their contract negotiations next year. The USW passed a resolution backing Senator Kennedy for President, called for renewed emphasis in its drives to organize whitecollar workers, presented its 1961 legislative program, and had a brief flurry with the Rarick rebels. PAGE 63

How to Bid Smarter on Defense Contracts

Because they don't check all the implications, too many firms wind up with profitless government contracts, says Harry B. Rottiers, director of defense contracts, Burroughs Corp. He lists eight areas to investigate before bidding—they may help you. PAGE 66

Materials Efficiency—How to Get Higher Reliability

Emphasis on reliability promises to become one of this decade's most significant trends. Hundreds of companies already have formal reliability programs; thousands more have informal programs. In all cases, success hinges on a basic change in your approach to managing the materials function—in design, purchasing, production, packaging, and transportation. PAGE 73

Plasmajets Headed for Production Roles

Plasmajets are deemed to be practical for constructing large, self-supporting shapes (such as missiles) from hard to handle materials. They're also practical for depositing refractory metals or ceramic materials on various structures with superior fidelity and density. You may find them useful in cladding of large sheets, or in building up metal structures on cheap disposable forms. Other benefits of plasmajets are listed. The accompanying photo shows an operator depositing an oxide on an experimental nose cone. Temperatures in the 35,000° F range are generated by the streams of superheated gases. PAGE 110

Tool Steels Ride the Business Trend

The tool steel industry is sensitive to every swell and dip in the economic cycle. Right now, it's awaiting a chance to ride the next crest. After last year's steel strike, a rush was on to replenish inventories and sufficient momentum was built up to carry into March, 1960, when shipments reached a peak. Shipments have decreased each month since then. PAGE 147

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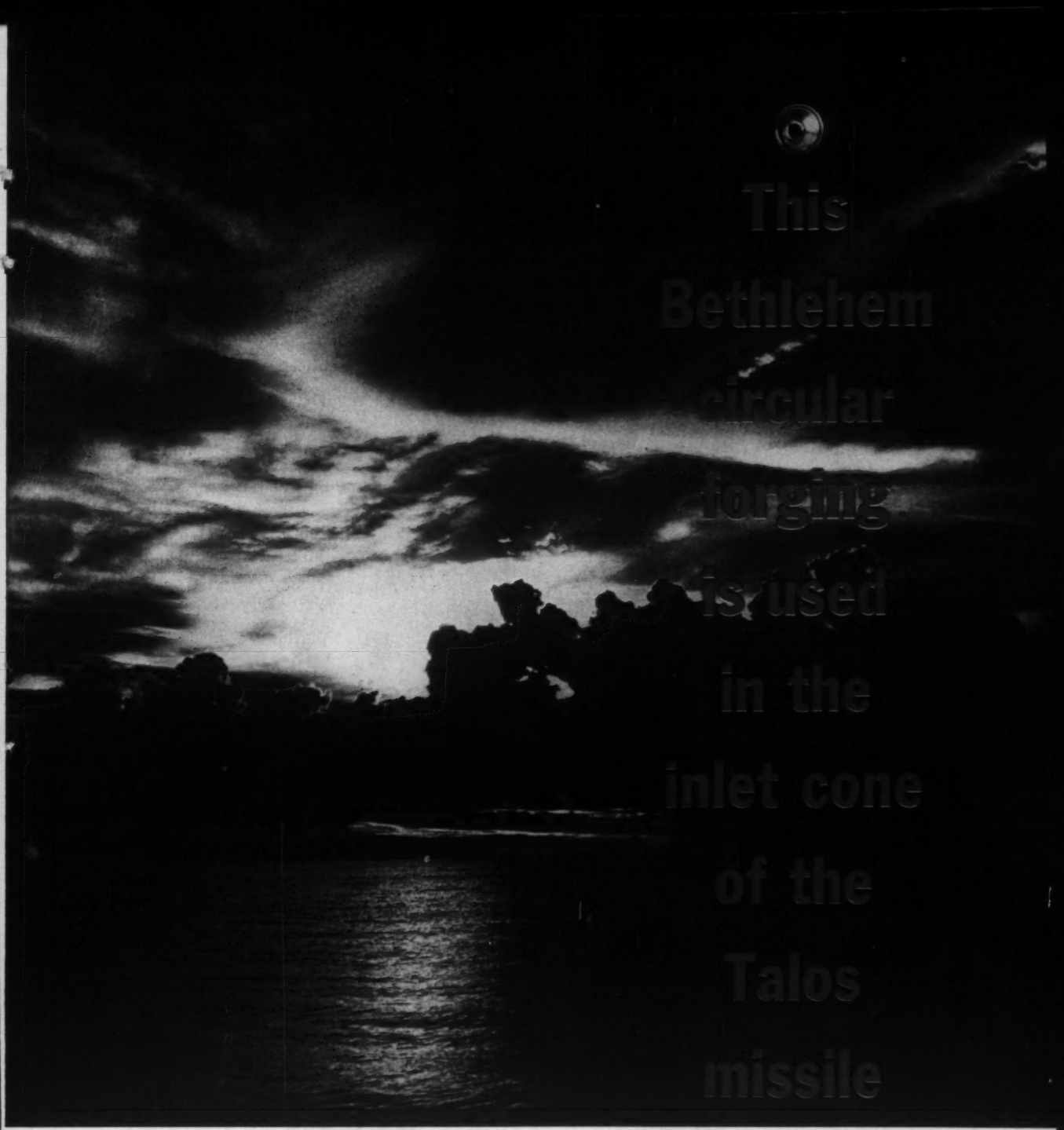

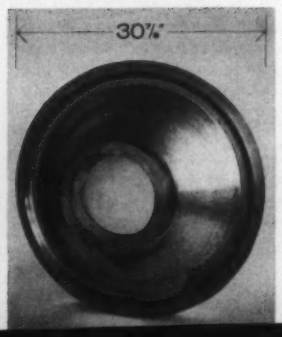

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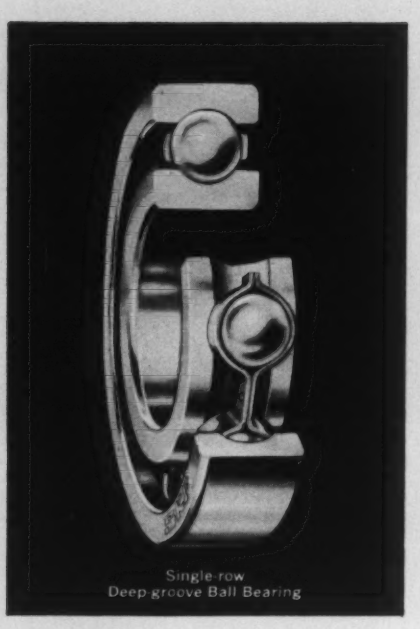

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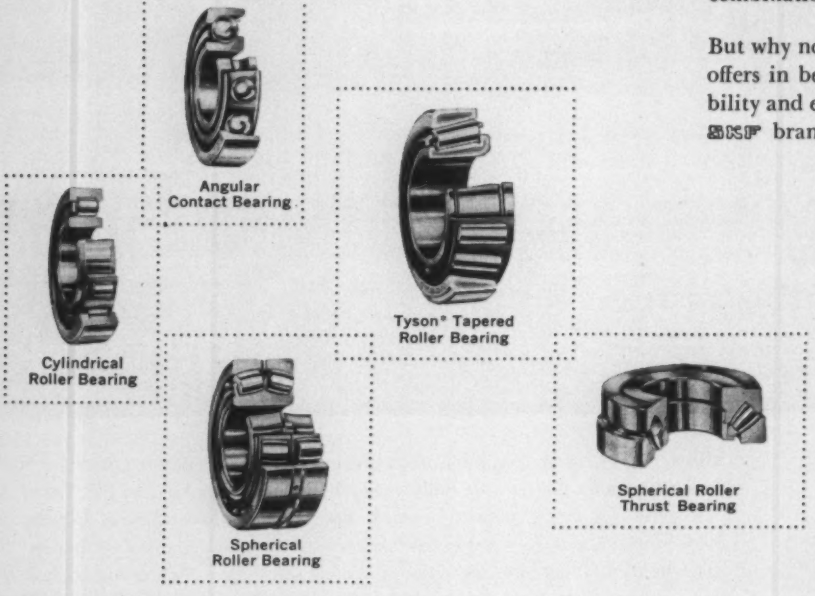

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Engineers and other technically-trained men are particularly prone to "drift with the tide" because their starting salaries are reasonably high and promotions come at regular intervals early in their careers. It isn't until later—too much later in many cases—that they discover there is a definite ceiling on their incomes as technicians.

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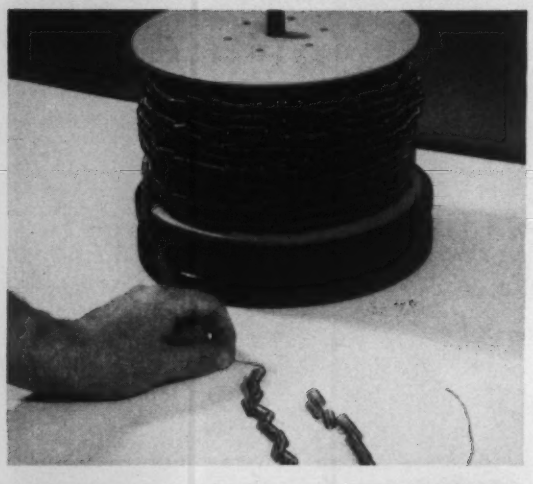

. . . more efficient handling, storing, sorting, orienting, feeding, placing of springs for installation

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A Model Will Solve a Problem . . .

. . . for Robert P. Schafer (right), July Usership winner and manager, Penndrill Mfg. Div., Pennsylvania Drilling Co., Pittsburgh. Our Pittsburgh resident editor, Bill Wallace, presented to Mr. Schafer STEEL's check for $500, a Usership plaque, and Honorary Editor card No. 9.

The company's testborer (shown), augers, drills, drives, and automatically samples. While primarily designed for foundation investigation, it is equally adaptable to mineral prospecting and drilling water wells.

Problem: Most companies wanted to see the multipurpose machine in action before buying. The rig is too big to haul around economically for demonstrations. Solution:

"We are a small manufacturer with small engineering, sales, production, and other forces. It has always been a problem to compete because we do not have salesmen canvassing the field. When I read your July 4 article, 'Models Help Sell Heald Units,' a thought came to me.

"I intend to write to Messrs. Abbott and Mackay (named in the story) and arrange for a quotation on a small scale model of our drilling unit. Armed with the quotation, and the article, I intend to bring up the subject at our next management committee meeting. I believe the illustrated article will sell our group on the idea of purchasing a model.

"We cannot economically justify having the machine on the road. In every case when we have been able to demonstrate our product, we have been able to sell it. It is of unique design, so the evidence is in seeing it work. People are always asking me how we get the derrick up and down. With a model, I'll be able to show them right on their desk tops.

"I believe I can convince our management that this is our way to sell. The article certainly points out the reasons why such a model is a good investment."

Honorable Mention Awards . . .

. . . handsome desk lighters, went to: John Bahny, foreman, Screw Machine Dept., Crescent Tool Co., Jamestown, N. Y.; Gerald J. Buckley, process engineer, Jenkins Bros., Bridgeport, Conn.; Robert L. Burns, manager, Production Engineering, Bellows-Valvair Div., IBEC, Akron; Henry Cornell, production engineer, Packaging Machinery Div., Food Machinery & Chemical Corp., Oakland, Calif.; Lanier Frantz, plant manager, Graham-White Mfg. Co., Salem, Va.; Albert J. Kuhn, vice president-purchases, Huenefeld Co., Cincinnati; R. J. McDermott, Clarion plant manager, Warren Corp., Clarion, Pa.; L. J. Thomas, purchasing agent, Thomas Mold & Die Co., Wooster, Ohio.

You Can Win $1000 This Month . . .

. . . in STEEL's Usership Idea of the Month Contest. Tell us, in 300 words or less, how you plan to USE an article or advertisement in this issue (or any other issue published this month—September, 1960) to help you accomplish an important personal or company objective. Be as specific as you can. If, in the opinion of the judges, yours is the best idea submitted—**you will win $500.**

There's more . . . you will win an additional $500 if you furnish written proof that you accomplished your objective. Proof must be submitted within six months after you are declared winner of STEEL's Usership Idea of the Month award.

Please identify your letters as Usership entries. They will be judged by a committee of STEEL's editors. All letters become STEEL's property.

You can enter as many times as you wish. Send your entries to me, Ed Service, Servicenter, STEEL, 1213 W. Third St., Cleveland 13, Ohio. **Deadline for this month's contest is Nov. 1.**

Cold Storage

For this issue, we had promised you an article that would pinpoint the state of the art and determine trends in cryogenics. A hitch developed.

Last week, U. S. Steel Corp. unveiled an unusual marketing plan and put a Sept. 22 news release date on its information. The editors' decision: Because of the time factor, put the cryogenics effort on ice and run the story headed "U. S. Steel Launches Design Program," Page

TIME SAVINGS!

Here's how Ex-Cell-O's Numera-Trol system of tape-controlled precision machine tools cuts costs for three modern manufacturers . . .

Precision Contouring Machine, controllable to .000025", saves 112 hours lead time, 54 hours grinding time in production of this templet.

Large steam turbine blade is produced by Precision Profiling Machine. Lead time saved, 120 hours; machining time saved, 78 hours.

Fuel control cam, produced by Precision Cam-Milling Machine, goes from performance curve to machined part in just 47.5 hours. Former method took 230 hours.

How many hours can Ex-Cell-O Numera-Trol save for you? For a prompt answer, see your Ex-Cell-O Representative, or call or write direct—and be sure to ask for your free copy of "A Guidebook to Numerically Controlled Machine Tools."

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106. We'll alert you when the cryogenics story is taken out of the freezer.

16,000 Reprints of . . .

. . . our Sept. 5 issue, "Our Fight for Survival in New World Market," were mailed within one week after the issue was published. Here are some comments from readers:

". . . This is one of the best contributions I have ever seen to the maintenance and preservation of our American way of life. I have suggested to our local chapter of the National Metal Trades Association that the same subject be adopted for conferences in the coming year," says Fred H. Lassy, manager of Industrial Engineering, Bostitch Inc., East Greenwich, R. I.

In asking about 500 reprints, A. Stewart Murray, president, Tyson Bearing Co. (Massillon, Ohio), a division of SKF Industries Inc., wrote ". . . perhaps distribution to each one of our employees would help them think about this matter that is important to everyone because it affects their companies and in turn, their jobs . . . your treatment is the best I have seen."

"Your special issue is a 'lulu,' " writes Algird C. Pocius, managing editor, *Blast*-publicity, Colorado Fuel & Iron Corp., Denver, Colo. "We want to get . . . it into the hands of our supervision—especially those on the front lines . . . What would be the cost for 700 reprints?"

Ralph L. Gray, chairman, Armco Steel Corp., Middletown, Ohio, wrote: "Please send me 20 copies of the issue . . . Your editors are to be congratulated on the fine job . . ."

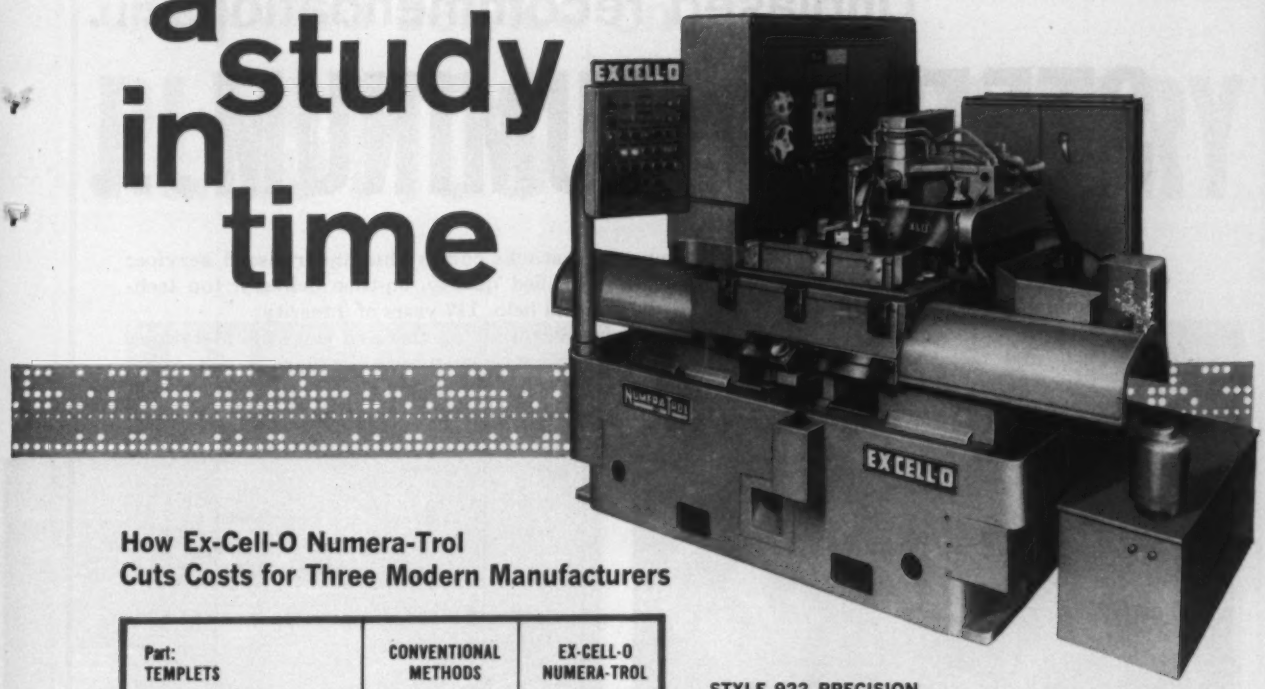
Scanning the Economic Skies

If you're wondering about the economic weather, check the forecasts of STEEL's Panel of Economic Consultants next week. In addition to presenting views on eight business indicators, the 60 top economists will answer a special question which some of you helped compose. (See STEEL, Aug. 22, pp. 5 and 6.) Associate Editor Bob Jaynes sends his thanks to the readers who submitted suggestions. Many of you sensed the gathering of economic clouds. Here is the question:

"If history is any criterion, the present cycle in the economy has about run its course and is due to turn down at any time. When will it occur? Do you foresee a recession? How long will it run? How will it compare in severity with the three recessions of the post-World War II period, and why? If we are not in for a recession, what factors will prevent it?"

You'll see what's in the air next week in the second of our semiannual economic forecasts.

a study in time



How Ex-Cell-O Numera-Trol Cuts Costs for Three Modern Manufacturers

Part: TEMPLETS	CONVENTIONAL METHODS	EX-CELL-O NUMERA-TROL
Lead time	128 hrs.	16 hrs.
Grinding per/piece	60 hrs.	6 hrs.
TIME SAVED	166 HOURS	

Part: FUEL CONTROL CAMS	CONVENTIONAL METHODS	EX-CELL-O NUMERA-TROL
Lead time	150 hrs.	40 hrs.
Machining per/piece	80 hrs.	7.5 hrs.
TIME SAVED	182.5 HOURS	

Part: STEAM TURBINE BUCKETS	CONVENTIONAL METHODS	EX-CELL-O NUMERA-TROL
Lead time	144 hrs.	24 hrs.
Machining per/piece	90 hrs.	12 hrs.
TIME SAVED	198 HOURS	

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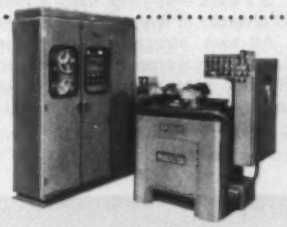

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Performs intricate and accurate milling and grinding of 3-dimensional forms.

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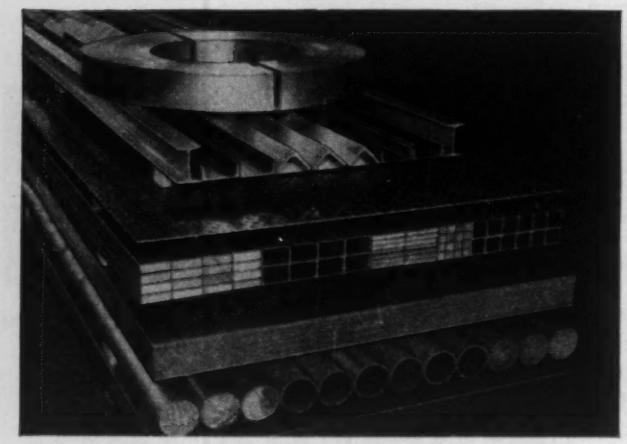
And along with the size and diversification of stocks comes this unsurpassed service: certified quality, on-time delivery, top technical help, 117 years of integrity.

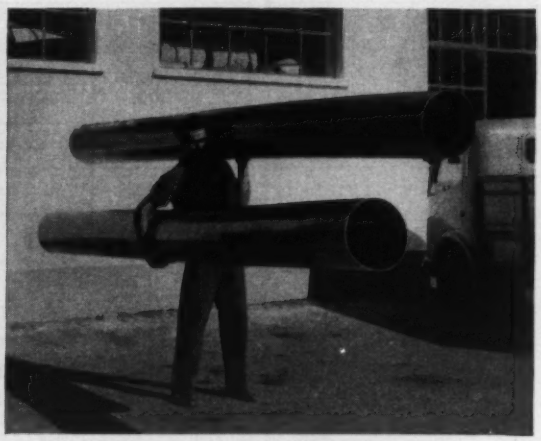
Put it all together and you have Metalogics—the Ryerson science of giving optimum value for every purchasing dollar. Ask your Ryerson representative for details.

CARBON STEEL—No one even comes close to the size and diversity of Ryerson stocks of hot rolled carbon steel. All bars, structurals and plates are of known analysis or physical properties. Widely acclaimed accuracy of Ryerson sawing, shearing and flame-cutting is assured by published tolerances that are the most exacting in the industry.

TUBING AND COLD FINISHED BARS—Here again, Ryerson stocks are by far the nation's largest—including seamless and welded mechanical tubing; hydraulic cylinder and fluid line tubing; structural tubing; new Ledloy® 170 tubing, etc. And in cold finished bars—shafting, machinery steel, accuracy stock and screw stock, including fast-machining Ledloy 375 & 300.



ALUMINUM—Nation-wide Ryerson service on Reynolds aluminum includes all mill products—a full range of alloys, tempers, gauges and sizes. Stocks include: flat and coiled sheet; plate; tubing and pipe; wire, rod and bar; structural and extruded shapes; commercial building products and related items.



INDUSTRIAL PLASTICS—Call Ryerson for Ryertex-Omicron PVC pipe and tubing, sheet and rod: plastic that conquers more than 281 corrosive liquids and gases—will not weather, rot or age. Also for rigid Kralastic and flexible polyethylene pipe, and Ryertex® laminated phenolic resin plastics in sheets, rods and tubes... special shapes molded to your specs.

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PLASTICS...MACHINERY

ALLOY STEEL—Ryerson developed and perfected a plan to assure risk-proof alloys through an 8-Step Certified Quality Program—and leads the industry in size and diversification of stocks, including case-hardening, direct-hardening and heat-treated alloys; leaded alloys, including Rycut® steels (fastest-machining in their carbon ranges); aircraft quality alloys, etc.

STAINLESS STEEL—2351 sizes, shapes, types and finishes of stainless in Ryerson stocks. All certified to meet ASTM, SAE, Military, DuPont or G.E. specifications—assuring close control over chemical composition and mechanical properties. Call us for all your requirements on stainless sheets, plates, bars, pipe and fittings and tubing, heads and machine-cut rings and discs. Cutting facilities include latest Heliarc equipment.

METALWORKING MACHINERY—More than 3800 types and models of machinery and tools produced by nearly 100 of the nation's leading manufacturers are available through the Ryerson Machinery Division. The broadest line available from a single source includes equipment for bending, braking, forming, hoisting, drilling, pressing, punching, rolling, sawing, shearing, threading, welding. Also, material handling equipment.

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CALENDAR
OF MEETINGS

Sept. 26-29, American Welding Society Inc.: National fall meeting, Penn-Sheraton Hotel, Pittsburgh. Society's address: 33 W. 39th St., New York 18, N. Y. National secretary: Fred L. Plummer.

Sept. 26-30, Instrument Society of America: Instrument-automation conference and exhibit, and annual meeting, Coliseum, New York. Society's address: 313 Sixth Ave., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 27-29, National Screw Machine Products Association: Executive seminar, St. Clair Inn, St. Clair, Mich. Association's address: 2860 E. 130th St., Cleveland 20, Ohio. Executive vice president: Orrin B. Werntz.

Sept. 27-30, Association of Iron & Steel Engineers: Annual meeting and exposition, Public Auditorium, Cleveland. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.

Oct. 9-13, Electrochemical Society Inc.: Fall meeting, Shamrock Hotel, Houston. Society's address: 1860 Broadway, New York 23, N.. Y. Executive secretary: Robert K. Shannon.

Oct. 9-14, American Institute of Electrical Engineers: Fall general meeting, Morrison Hotel, Chicago. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Oct. 10-12, National Electronics Conference Inc.: Annual meeting, Sherman Hotel, Chicago. Conference's address: 228 N. LaSalle St., Room 2104, Chicago, Ill. Executive secretary: R. J. Napolitan.

Oct. 10-13, American Mining Congress: Metal mining congress, Las Vegas, Nev. Congress' address: 1102 Ring Bldg., Washington 6, D. C. Executive vice president: Julian D. Conover.

Oct. 10-14, Pressed Metal Institute: Annual meeting, Shawnee Inn, Shawnee on Delaware, Pa. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

Oct. 10-14, Society of Automotive Engineers Inc.: National aeronautic meeting, manufacturing forum, and engineering display, Ambassador Hotel, Los Angeles. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Oct. 12-14, Gray Iron Founders' Society Inc.: Annual meeting, Netherland-Hilton Hotel, Cincinnati. Society's address: 930 National City-E. 6th Bldg., Cleveland 14, Ohio. Executive vice president: Donald H. Workman.

Oct. 13-15, Nonferrous Founders' Society: Annual meeting, Grove Park Inn, Asheville, N. C. Society's address: 1604 Chicago Ave., Evanston, Ill. Executive secretary: Herbert Scobie.

TIPS FROM A ROLL MAKER'S NOTEBOOK

MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings

With slabbers, the cooler the rolls, the longer they last

We have been somewhat concerned during the last year or so by what seems to us a more than normal number of premature roll failures in universal slabbing mills. These failures have not been limited to any one brand of rolls.

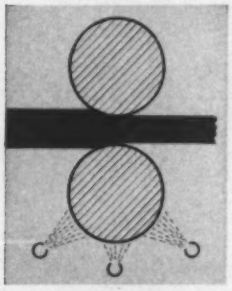
As a result, we have been checking among the many users of universal slabbers of our acquaintance, and in particular, with the operators whose mills have been giving them good outputs between roll replacements.

We think we have the answer to part of the problem, and will pass it along to you. Even if you don't operate a slabbing mill, you may find it helpful in connection with hot mill operation in general.

Not enough water. In every troublesome case that has come to our attention, too little cooling water was reaching the bottom roll, either because of an inadequate cooling system, or clogging of the spray header. Here is the way two steel plants are currently taking care of the problem:

CASE A: Water is applied to the top roll by means of a water box, with wipers on both entry and delivery sides. Three 4-inch pipes spray the bottom roll, one directly beneath the roll and the other two on the entry and delivery sides. When this mill was first installed, it had only one pipe directly beneath the bottom roll, which resulted in frequent roll breakage.

This mill is particularly careful about bringing the rolls up to working heat before beginning production. Standard practice is to pass two ingots three or four times through the mill, taking very mild reductions, with the water valves opened only half way. The two "start-up" ingots are then sent back to the soaking pit, the water is turned up to full pressure and a new, hot ingot is brought up to start the turn's regular production run.



Good blooming and slabbing mill roll-cooling arrangement utilizes two or more water lines to the bottom roll, which is usually the first to show signs of premature failure.

CASE B: This mill as delivered had only one spray header underneath the bottom roll. Bad fire cracking and roll breakage occurred almost from the day the mill was placed in production. Study of the mill showed that scale was lodging between the water pipe and the bottom roll, so that little if any cooling water was reaching the roll. Two additional water lines were brought in, each delivering its water about half way up the side of the roll. The general problem has been effectively solved by this expedient. Today, this mill at times rolls up to 140,000 tons before the rolls are redressed although normal practice is to change rolls after approximately 75,000 tons.

This is the mill described in Case A; it has an excellent record, thanks to careful control of heat in the rolls and the avoidance of sudden temperature changes.

Mack-Hemp has evolved a number of roll analyses that are especially good for slabbing and blooming work because of their combination of strength and resistance to fire cracking. Mack-Hemp *Technalloy* rolls cast from chrome-moly steel and specially heat treated offer excellent resistance to fire cracking and breakage under the most severe operating conditions. Mack-Hemp *Superalloy*, a nickel-chromium-molybdenum steel roll, turns in outstanding performance in blooming mills where side wear and fire cracking in the passes has been severe.

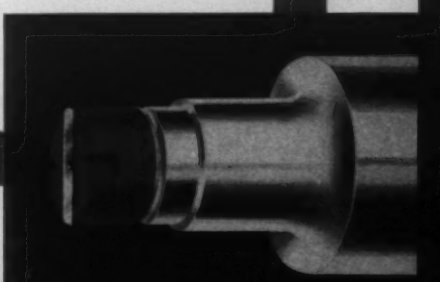
Whatever your problem of roll use, you'll find that Mack-Hemp can provide useful advice or helpful suggestions. We've been accumulating data on roll performance for more than a century and a quarter . . . it's yours for the asking. 'Phone or write us at any time.

MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

Division of E. W. BLISS COMPANY

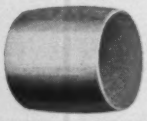
Presses, Rolling Mills, Special Machinery



When selecting roller bearing pillow blocks, remember

it's what's inside that counts!

MAXIMUM SIZE AND NUMBER OF ROLLERS for highest capacity



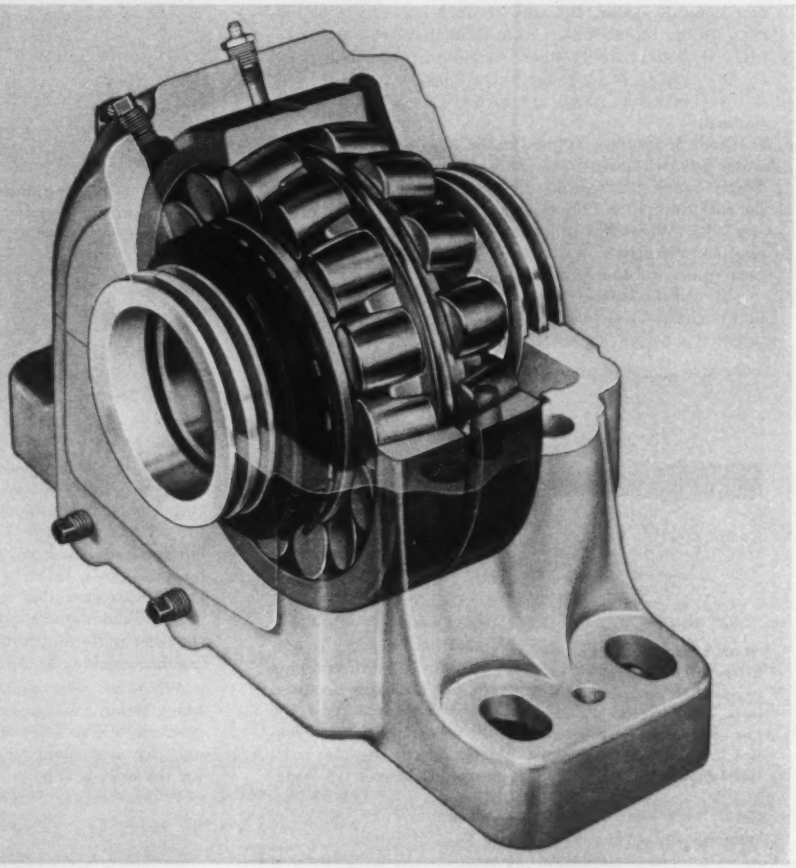
CENTRIFUGALLY CAST, PRECISION MACHINED BRONZE RETAINERS for smooth, quiet operation

HIGH, HEAVY INNER RING FLANGES for ease of installation and removal

AND INSIDE LINK-BELT ROLLER BEARING BLOCKS you'll find Link-Belt's new spherical roller bearings . . . with big, mirror-smooth, highest capacity rollers; centrifugally cast, precision machined bronze retainers; heavy, broad-shouldered inner rings. *All* the best features of modern bearing design compactly unitized for utmost economy and long service life.

Link-Belt spherical roller bearing pillow blocks are self-aligning. Available in adapter mounting and direct-shaft mounting types for shafts from 1 7/16" to 12". Choice of two effective seals: all-purpose steel, multi-labyrinth seals, or Dacron-contact seals.

For full details, call your nearest Link-Belt office or authorized stock-carrying distributor. Look under BEARINGS in the yellow pages of your telephone directory. Ask for Book 2760.



SERIES 6800, 6900, 7800, 7900 have exceptionally rugged, two piece housings—machined as two perfectly matched parts providing easy installation.

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SELF-ALIGNING BALL AND ROLLER BEARINGS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney) Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 15,414

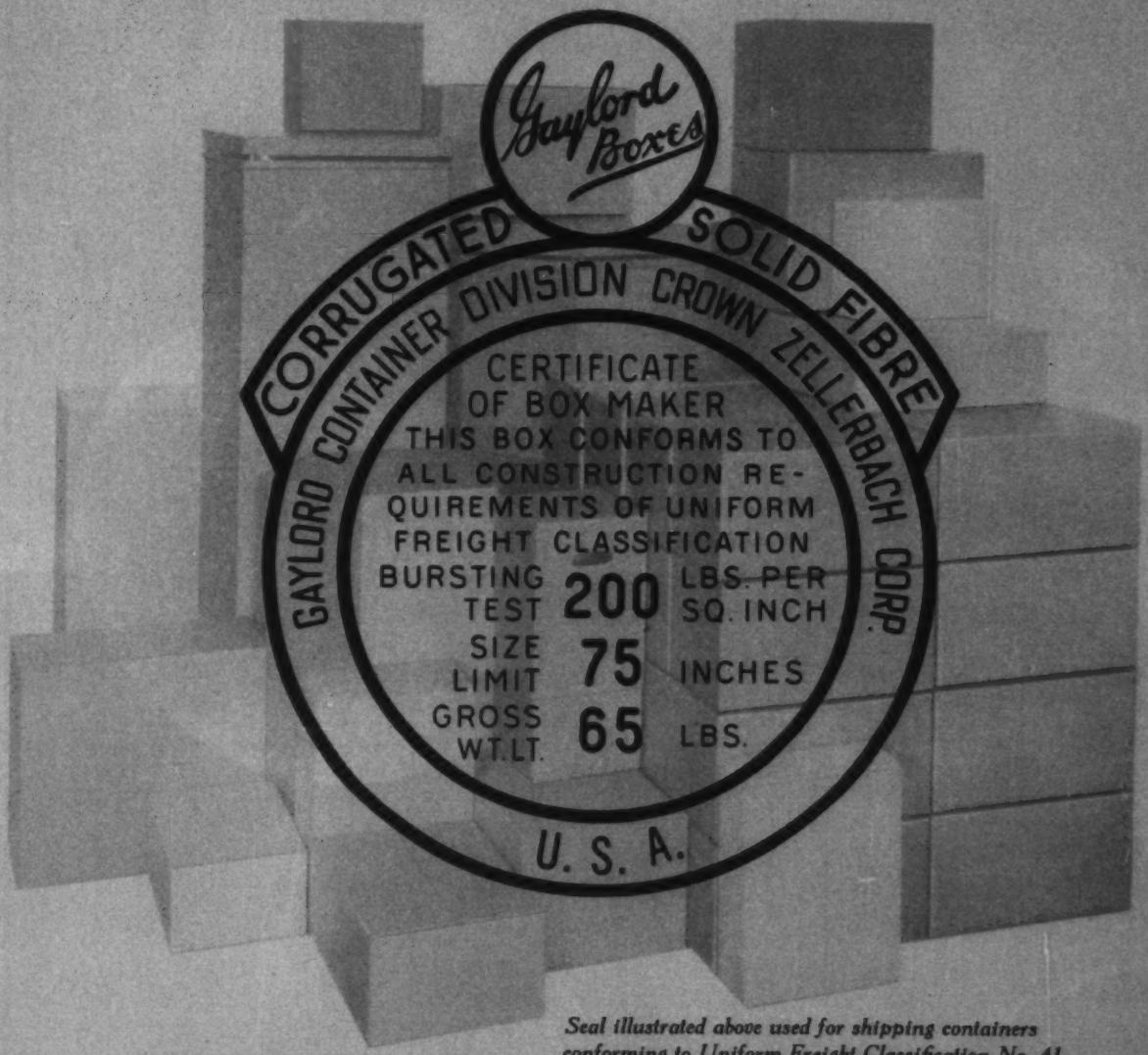
This is only one proof of GAYLORD *quality*

Here you read the measurable qualities in Gaylord Containers.

But how do you measure experience and ingenuity . . . which are *extra* qualities built into every Gaylord box?

Gaylord is part of a completely-integrated, nation-wide organization of packaging talents, devoted to delivering the most efficient, most economical container you can buy.

Your nearby Gaylord Man can prove this. Why not let him try?



Seal illustrated above used for shipping containers conforming to Uniform Freight Classification No. 41.

CROWN ZELLERBACH CORPORATION
GAYLORD CONTAINER DIVISION

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PLANTS COAST TO COAST

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NEU-TRI

STAYS STABLE, PROTECTS AGAINST CORROSION

The super-stable *neutral* trichloroethylene from Dow —NEU-TRI®—gives you more mileage for your solvent dollar because it *stays* stable—even after prolonged periods of vapor degreasing. The powerful built-in stabilizer system in NEU-TRI protects parts and equipment from corrosion, staining and pitting . . . increases cleaning efficiency.

Dow also offers ALK-TRI®, the amine-stabilized tri with powerful solvency, and HI-TRI®, the trichloroethylene for cold cleaning missile components. HI-TRI has excellent shock sensitivity properties and leaves little or no residue.

COLOR CODED—Drums for each of Dow's chlorinated solvents are distinctively colored for easy identification—even from 100 feet away. NEU-TRI, for example, comes in blue and white drums. To help you select the right solvent for your operations, call your distributor of Dow solvents.

Chlorothene® NU, the safer solvent, can do a big job in every plant . . . for cold cleaning small metal parts, electric motors or for general maintenance. Ideal for spray, dip, wipe or bucket cleaning. Combines high safety, low toxicity.

NEU-TRI has high solvent power, low boiling point, high vapor density. This simplifies maintaining a definite vapor level, reduces amount of solvent drag-out during work transfer. Result—fewer rejects, substantial heat savings.

ASK YOUR DISTRIBUTOR of Dow solvents for this booklet on trichloroethylene. It highlights the features of NEU-TRI as a fast, efficient vapor degreasing solvent. Get in touch with your distributor or write to your nearest Dow sales office.

SEE YOUR DISTRIBUTOR OF DOW SOLVENTS FIRST!

The widest line of industrial solvents: Trichloroethylene • Perchloroethylene • Chlorothene NU • Methylene Chloride

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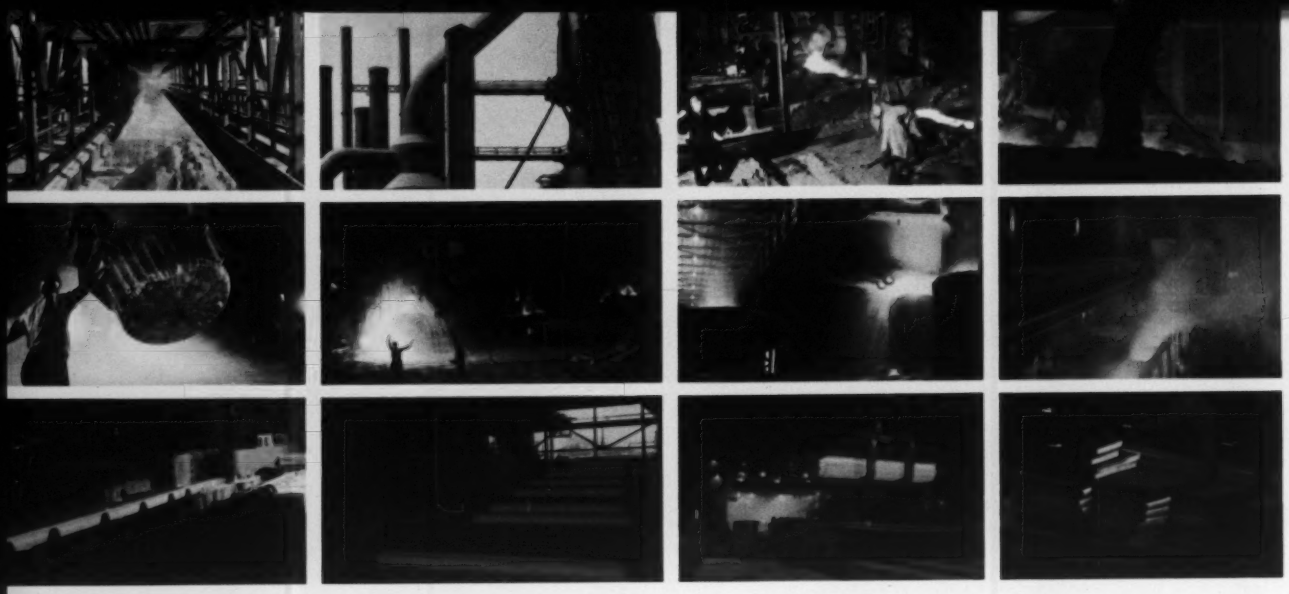
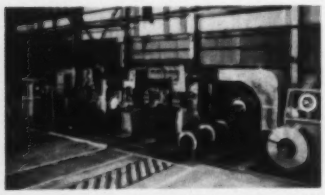
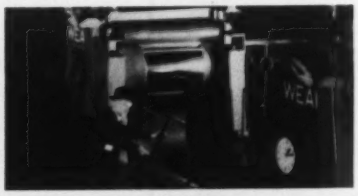
What's ahead for the Steel Industry?

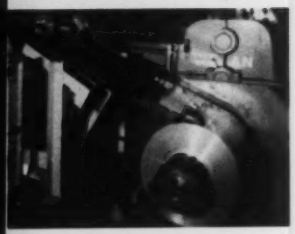


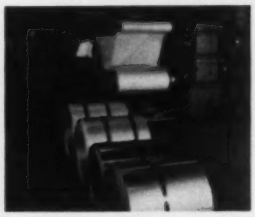
A decade of growth,

but with greater challenges to be met

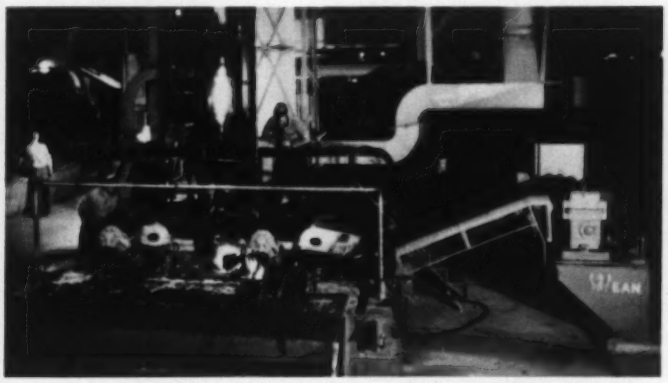


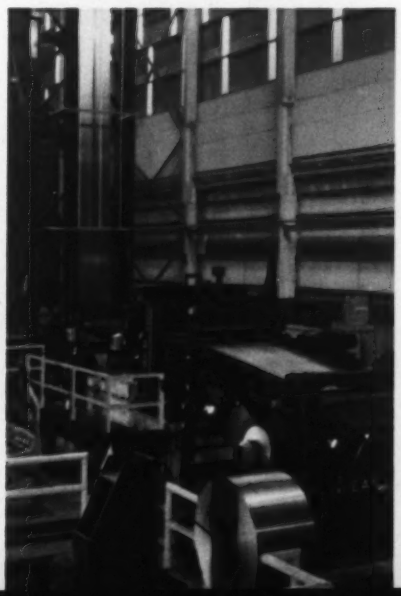






by each Steel Producer





THE steel industry traditionally has been able to solve most of its problems by growth. And the saga of this growth, both in tonnage and versatility of our mills, is an impressive one. Never before has steel been so important to our nation. And with soaring population, a steadily climbing standard of living, and exciting new products on the horizon, the further expansion of the steel industry is assured.

But the next decade poses challenging problems with this promise of growth: increased competition, shifting markets and the changing nature of steel demand are all problems for which each producer must find his own, best answer.

Cost reduction is one area that must be given very close attention. In some cases, expanding production will help "dilute" costs; in others, true reduction of costs by automation of present equipment and technological improvements is the answer.

Modernization will be a prime objective for many firms. Old equipment will be replaced by high speed, high production units which will greatly increase efficiency.

Planned distribution will continue to be a major factor in the development of new facilities. Every expansion program will have to be plotted with regard to market areas and transportation of raw materials and finished products. The Seaway project and the recent development of rail-highway transportation are examples of new opportunities in this area.

Customer service has already reached a remarkable stage of development in metallurgical liaison, but even greater strides are indicated for the future. Steel firms must help the customer get the improved materials he needs, when he needs them, and at a competitive price.

Quality control will be given even greater emphasis than ever before in order to assure customers of uniform quality materials in the competitive days ahead. Closer control will reduce scrap losses in production, too.

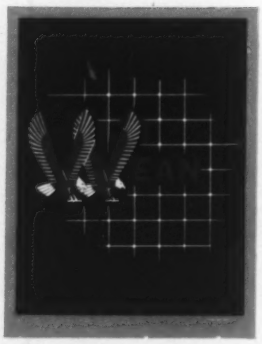
New markets will be tapped by some firms as they diversify their output through addition of new finishing facilities. New products, too, will open new markets for steel: vinyl-clad strip and "thin" tin plate, recently emerged from the research laboratory, are typical.

Wean Engineering has dedicated its resources and abilities to one field: the design and construction of sheet, strip and tin plate processing lines for steel producers. In this specialization, we have been privileged to work with all the major steel companies over the 31 years of our history.

2179 Years of Strip Processing Knowledge

The cumulative experience of Wean's personnel represents a good many lifetimes devoted to one field: continuous strip processing line design and manufacture. The "creative engineering" abilities of our staff have given the steel industry more efficient and productive processing lines for tinning, galvanizing, annealing, pickling, cleaning, coil preparation, shearing and slitting.

Today, as ever, we look forward to a continuation of the working partnership where our experience and capabilities can help the steel industry meet the challenges of the Sixties.



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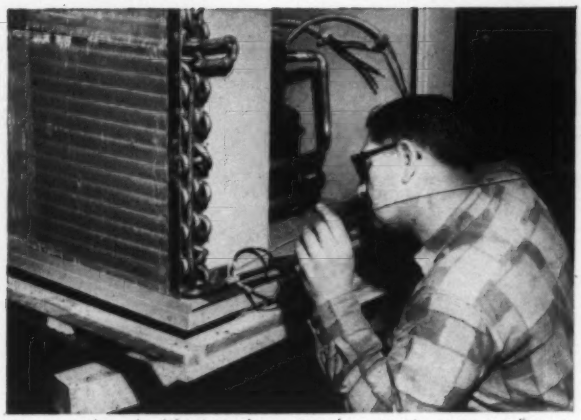
HOW TO MAKE 4,999 JOINTS WITHOUT FAIL



Here, with a double tipped oxyacetylene torch, operator Brazes condenser coil joints. This condenser-compressor assembly contains 30 hook-up joints, not counting return bends.

The unit evaporator, located inside the house, contains 36 hand-brazed SIL-FOS 5 joints.

International Heater Does it With HANDY & HARMAN SIL-FOS 5

Production statistics of this manufacturer of heating and air-conditioning equipment show that perhaps one in five thousand hand-brazed joints may need touching up. This is a micrometer measurement away from absolute perfection.

One of the Utica, New York, company's products is a home air conditioner that utilizes the existing duct work of the structure's hot-air furnace. Its novelty lies in the fact that the unit's compressor and condenser are located outside the house for noise-free coolness inside the home.

The unit's evaporator is installed on top of the furnace for simple tie-in to the plant's ducting for hot-weather operation.

Shown here in production is International's Model 5-5B of 5 ton capacity.

This "joint in quantity" record is being duplicated by SIL-FOS 5 silver alloy brazing in the manufacture of heating, air-conditioning and refrigeration equipment everywhere. Its strength, air- and leak-tightness and ease of application are some of the reasons that make Handy & Harman SIL-FOS 5 brazing one of the *surest* metal joiners in existence. We'd like you to know more about SIL-FOS 5 and the job it can do for you in joining copper and copper alloys in any shape, size and complexity. Our Bulletin 20 deals with this in a complete and informative manner. A request to Handy & Harman, 82 Fulton Street, New York City 38 will bring you your copy.

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Much of the beauty of Chrysler cars

The proper foundation of a Chrysler-style paint job shows itself in this gleaming Plymouth "body-in-white"—steel with the surface finish a truly fine car must have.

Body parts for Chrysler cars emerge from a complex of huge presses and coils and sheets of flat rolled steel. Floor pans are formed, to be wed further on into single unitized assemblies of 50 major parts by fully-automated resistance welders. Doors are stamped with great precision, and 100 ton presses squeeze out car roofs, without a break or blemish.

This is Chrysler Corporation's Ohio Stamping Plant, giant of the auto industry, where 28 major stamping lines eat 2000 tons of steel a day and produce 600 different body parts. Steel is the basic raw material of this amazing plant—and the men who buy and use it know exactly what they need. As a regular supplier, J&L matches their needs *consistently*.

J&L STEEL

Jones & Laughlin Steel Corporation

3 GATEWAY CENTER, PITTSBURGH 30, PA.

Steel

Feast your eyes on over 1000 lbs. of unadorned steel! Notice how the steel itself contributes to the elegance and grace of Chrysler styling–how, even in this raw metal stage, the "body-in-white" has a lustrous finish of real beauty.

comes from the steel itself

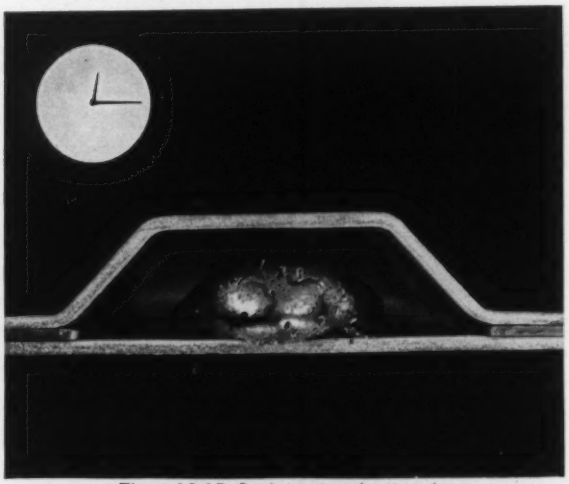
Each die-forming situation is individual and demands a specific set of metallurgical properties from the steel. In many cases, the factor of extreme importance is surface finish of the steel. Other times, drawing quality is paramount. And often, *combinations* of these and other qualities are needed, balanced one against the other with metallurgical precision.

The Ohio Stamping Plant may be big. But it is a tight operation—efficient, competitive, economical, with full control of quality at all times to insure the beauty and soundness of Chrysler bodies. That J&L steel is bought regularly, and used at one time or another in all the major parts produced by the Ohio Stamping Plant, speaks well indeed for J&L quality.

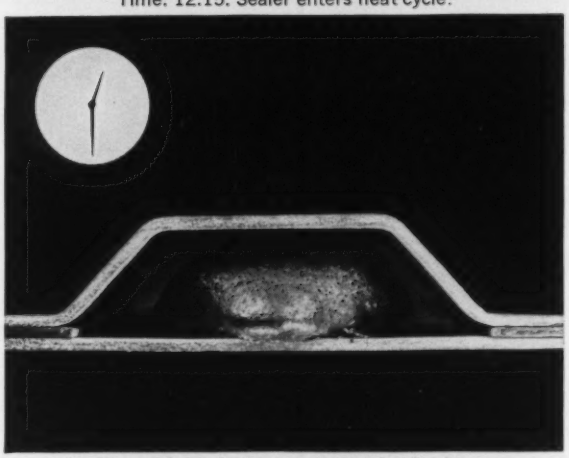
This is the roof line–at full rate of production. J&L is one of only three suppliers who can provide the 80-inch, 0.038-gage coils Chrysler needs here. Breaks and strain lines cannot be tolerated on roofs, so drawing quality is vital–as is surface finish, for reasons of appearance.

◀ This Steelmark identifies products made of steel. Look for it when you buy.

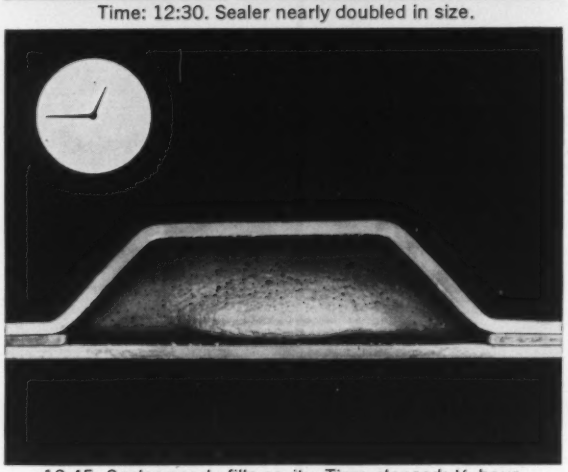
Positive way to seal irregular gaps and seams—3M Heat Expandable Sealers



Time: 12:15. Sealer enters heat cycle.



Time: 12:30. Sealer nearly doubled in size.



12:45. Sealer nearly fills cavity. Time elapsed: ½ hour.

You can simplify tough sealing jobs of irregular gaps and seams with 3M Heat Expandable Sealer EC-2117. When heated this liquid will expand 150% in volume and cure to a solid sponge rubber material to tightly fit the shape of the seam, affording a weather-tight, water-tight, dirt-tight seal.

EC-2117 is designed to expand and cure to a resilient sponge-like rubber which will adhere to most surfaces. It can also function as a weld-thru sealer which does not alter normal spot welding procedure, nor interfere with weld quality. EC-2117 adheres well to both clean and oily surfaces. Use it wherever irregular openings must be filled, or where seam width is not constant.

Let 3M Adhesives, Coatings and Sealers help speed your production, improve product quality. For free information, write on your company letterhead to: AC&S Division, 3M Company, Dept. SBEE-90, St. Paul 6, Minnesota.

ADHESIVES, COATINGS AND SEALERS DIVISION

MINNESOTA MINING AND MANUFACTURING COMPANY

...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

He's making a Monarch Lathe...

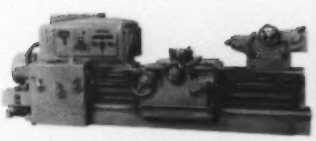
One example of where the extra values come from—in your MONARCH Lathes

This, sir, is the heart of the hydraulic circuitry in a modern Monarch headstock. This is our own *brazed* aluminum manifold and, bluntly, there's nothing else like it. Almost no piping or tubing. No varying pressures or incipient leaks. Just carefully machined flow channels in a core brazed to the two aluminum covers—for permanent undeviating responses. Courtesy of the Monarch Metallurgical Laboratory, exclusively. And component by component, assembly by assembly, you find the same story repeated throughout your Monarch Lathe.

We obviously can't hang the same price tag on this machine that you find on the lighter, stripped-down competition. So what price quality?

Assume someone in your shop picks up a "bargain" 5 H.P., 5000 lb. lathe with capacity of about 7½ cu. in. per minute. After you've discounted your bargain, how will your piece costs compete compared with a 20 H.P., 9600 lb. Monarch throwing 36 cu. in. of chips per minute? Or your down-time? Or your machine life?

Where's the "bargain?" Let us prove that it pays to buy quality. In our shop—on your job. Just write—THE MONARCH MACHINE TOOL COMPANY, SIDNEY, OHIO.



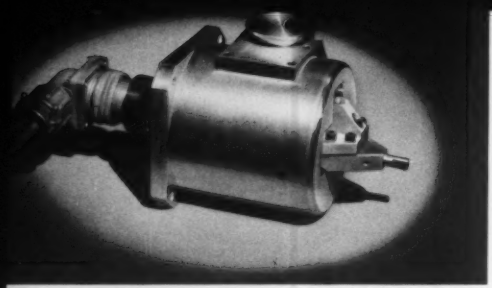
WHEN YOU BUY VALUE
MONARCHS COST LESS

Monarch
TURNING MACHINES

VISIT MONARCH—*We'll turn your part to return you profit*

Don't Tool Up for Tomorrow's Boom with Yesterday's Lathes

MONARCH'S SPECIAL-PURPOSE LATHES OF TOMORROW...



The Series 180 tracer head—an advanced engineering jewel from the Development Laboratories of Monarch.

2..The Series 180 Ultra-Precision Contouring Lathe

Ultra-precision tolerances are brought to a new degree of perfection on this chucking type machine for contouring the O.D. and I.D. of thin-wall spherical and related shape work pieces. From the floor up the Series 180 is new in concept. For example:

1 The Monarch electro-hydraulic tracer has a stylus deflection pressure of only 1½ ounces. This, plus electrical amplification of stylus movement, instantly translates template contour change into hydraulic slide movement.

2 Tracing around a template, the contour is reproduced at the tool within a total accumulated error of ±75 millionths.

3 The constant surface cutting speed drive is separately mounted to eliminate vibration transmittal to the bed.

4 Drive is flexibly coupled to the spindle which is set at a 30° angle to the bed axis. Runout at the spindle nose is less than 20 millionths.

5 Spindle bearing lubricant is refrigerated; the floor-mounted tracer hydraulic tank is separately cooled and coolant temperature is controlled within ±.5°.

6 The machine is built and tested in a temperature controlled area and must be so operated.

The performance characteristics of the Series 180 cannot be equalled by any other lathe. Development of this machine is but another example of the many seemingly impossible turning problems solved by . . . *The Monarch Machine Tool Company*, Sidney, Ohio.

Monarch
TURNING MACHINES

IF IT CAN BE TURNED, THERE'S A MONARCH TO DO IT BETTER AND FASTER

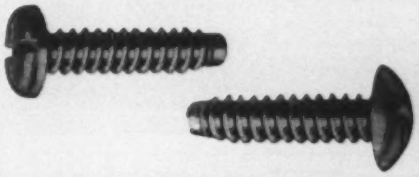
Need quick delivery on ALCOA ALUMINUM FASTENERS? Pick up your phone!

It's that easy. Like calling your own stock room and having what you need sent over—aluminum bolts, nuts, rivets, machine screws, wood screws, sheet metal screws, washers, whatever your job calls for in standard sizes and types!

There's a local distributor nearby, with full stocks of Alcoa® Fasteners. He offers the largest line, the fastest deliveries.

Not to mention top quality that spells lower production costs for you. Alcoa Aluminum Fasteners offer many advantages: corrosion resistance; full threads; no burrs; fully heat-treated, high-strength alloys—and always a *full count*. You get what you pay for, every time.

Look in the Yellow Pages. Call your Alcoa distributor. Get all the light, strong, attractive, bright Alcoa Aluminum Fasteners you need. Want more information and samples first? Just mail the coupon!



ALCOA ALUMINUM

ALWAYS FASTEN ALUMINUM WITH ALCOA ALUMINUM FASTENERS

Aluminum Company of America
2001-W Alcoa Building, Pittsburgh 19, Pa.

Please send me complete specification data and samples of Alcoa Aluminum Fasteners.

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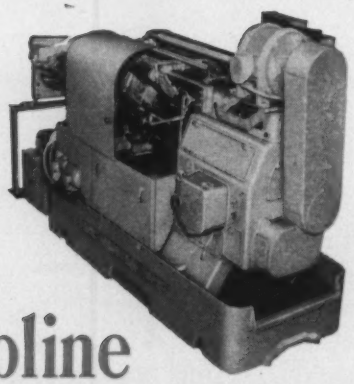
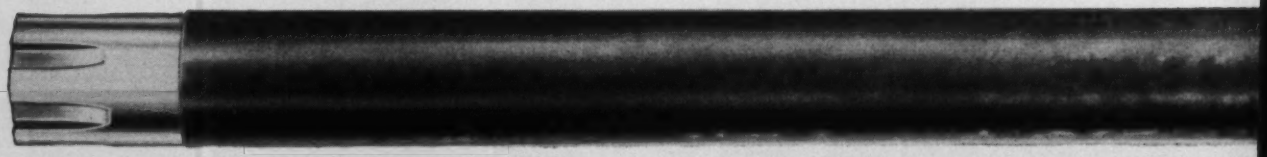
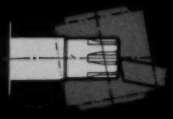
CITY_____ ZONE____ STATE_____



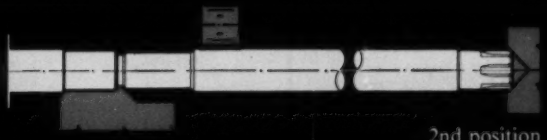
Acme-Gridley performs spline hobbing in a single set-up . . .

slashes ringer roll shaft production time 63%!

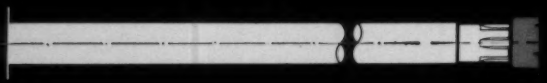




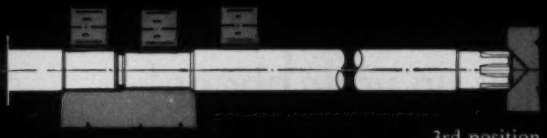
5th position
Hob Spline—Face Front (spindle clutch disengaged, spindle driven from hobbing attachment)



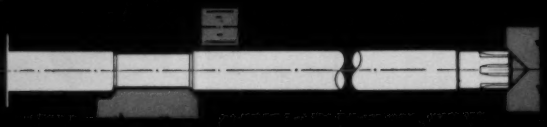
2nd position
Form Spline Dia. of Next Piece and Breakdown for Cut-off—Support



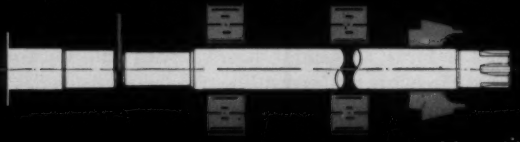
6th position
Feed Stock



3rd position
Shave Rear Dia. and Spline Dia.—Support



1st position
Form Rear Dia. Past Cut-off—Support



4th position
Support—Pick-up—Cut-off

6 Operations in 27.9 Seconds

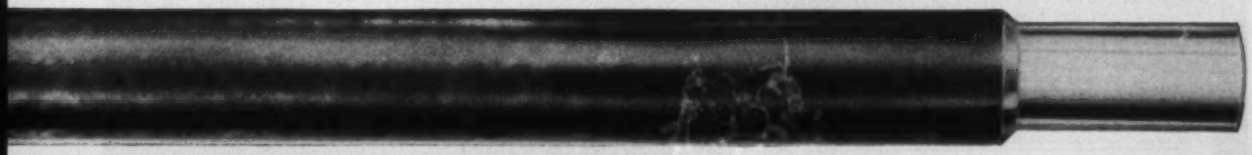
Here's how imaginative National Acme solutions to tough machining problems extend total machine capability and pay off in *tangible* production savings.

Spline hobbing is generally considered beyond automatic bar machine capability. Yet, an ingenious National Acme hobbing attachment . . . installed on an Acme-Gridley 1¼" RA-6 with modifications . . . lets a well-known manufacturer of ringer roll shafts do spline hobbing in the primary set-up; has cut per-piece production time 63%. In addition, a unique automatic feeding arrangement has drastically reduced stock-loading downtime.

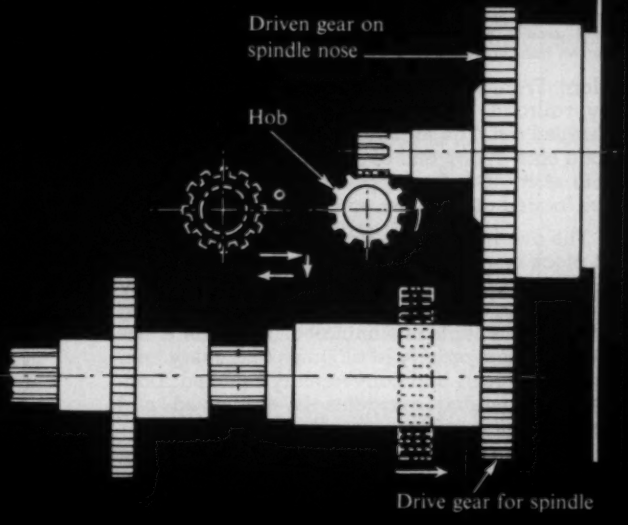
Special attachments like the spline hobber, plus such standard features as direct camming, independently operated toolslides, and a wide open tooling zone are the reason Acme-Gridley capability is limited by imagination only. No wonder cost-conscious manufacturers everywhere depend on Acme-Gridleys for higher mass production efficiency at lower cost. Detailed information on the world's most complete line of multiple and single-spindle automatic bar and chucking machines is yours for the asking. Call, write or wire.

National Acme's "Zone of Responsibility" includes all phases of cost reduction. Check YOURS . . . Then Check National Acme

Direct Costs: these include direct dollar savings as realized by thousands of manufacturers . . . an "everyday" job for Acme-Gridleys. **Indirect Costs:** effecting important savings in maintenance, downtime, scrap reduction, tool costs, etc. **Product Redesign:** teaming with your design group to take full advantage of Acme-Gridley's cost reducing capabilities. **Direct Material Costs:** our engineers provide important savings in this area by constantly matching machines and tools to modern metallurgical problems. **Make-or-Buy Reviews:** in many cases our Contract Division can assume your production headaches and relieve you of immediate capital investment. **Spot Modernization:** pioneering in modern tooling methods, and the flexibility of Acme-Gridleys can provide many "on-the-spot" savings.



Spline hobbing in the fifth position . . . a closer look



When the hobbing attachment advances, a gear on the attachment engages a gear on the spindle nose and drives the spindle at the required speed for hobbing.

MMT-PE
MODERN MACHINE TOOLS PRODUCTION EFFICIENCY

National Acme

THE NATIONAL ACME COMPANY
189 E. 131st STREET
CLEVELAND 8, OHIO

Sales Offices: Newark 2, N. J., Chicago 6, Ill., Detroit 27, Mich.

TRAMRAIL TRANSFER CRANES *SYSTEMATIZE* HANDLING IN STEEL WAREHOUSE

The large storage area is completely covered by Tramrail crane service. Every item can be seen from the floor and readily reached with the two transfer cranes.

The Tramrail transfer cranes make it easy to place the long unwieldly pipes and bar stock into storage at any height. This makes for orderliness, which is an important factor in securing high operating efficiency.

A LARGE modern warehouse at Atlanta, Georgia, was designed to make use of overhead Tramrail equipment to enable the handling of large unit loads in and out of storage with the least effort and in the quickest time.

The principal storage section is provided with two parallel runways each having three tracks. On both runways is a 64-foot transfer crane that travels the length of the room. Cross-overs are provided, enabling a hoist carrier transferring from one crane to the other. This makes it possible to haul materials between any two points in the entire area without rehandling.

Steel is constantly on the move in this active plant. From 60,000 to 70,000 lbs. are brought in by railroad car daily and like amounts are shipped out. The material is unloaded from railroad cars at one end of the building and placed into storage. It is shipped out on trucks which are loaded at the other end.

The overhead crane system makes it possible to place incoming materials into allotted storage spaces at once. The need of storing temporarily in aisleways or other areas and extra handling which this entails is eliminated. Thus, the warehouse is kept orderly at all times and every item is readily seen and conveniently reached. Danger of handling accidents is minimized and overall efficiency is unusually high.

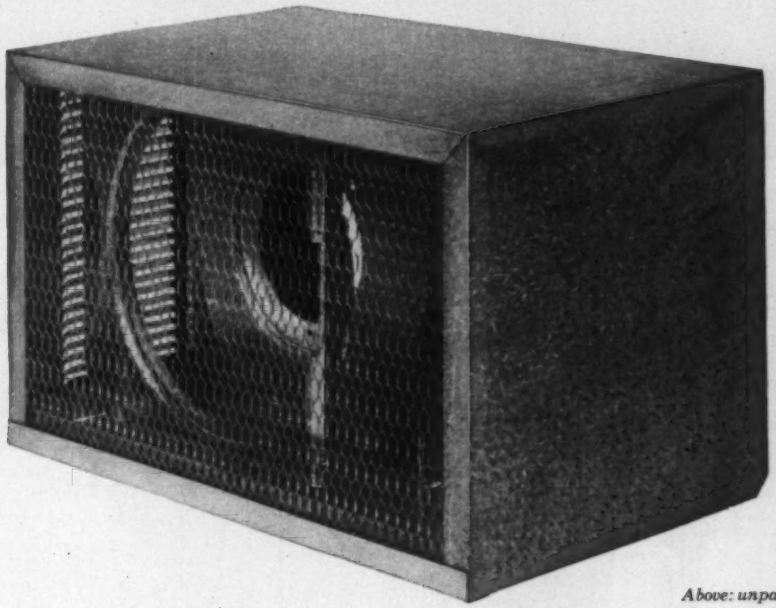
GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7881 EAST 284th STREET, WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

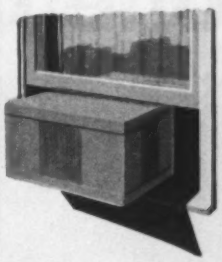
Better Products Through Better Methods and Steels



Above: unpainted air conditioner cabinet

How modern zinc-coated steel sheets keep air conditioners weatherproof—season after season.

When cold-rolled sheet steel formed the cabinets and special drawn base pans of air conditioners, they were primed and painted inside and out to protect them from constant exposure and functional moisture. Even so, corrosion often took hold around fastenings, louver edges and scratches.



Now that Weirkote continuous-process zinc-coated steel is used, the cabinet, louvers and chassis can be cut, bent and formed (even worked to the limits of the steel itself) without chipping or flaking the corrosion resistant zinc surface. When the outside paint finish is applied (primarily for decoration) the air conditioner has the double protection of a coating of paint and a coating of zinc assuring corrosion-free service for many years to come.

It's because of this weather-shedding surface, this superior formability that continuous-process zinc-coated steel is more and more the metal specified for air conditioning, heating and ventilating equipment.

A major supplier: Weirton Steel Company—producer of Weirkote continuous-process zinc-coated steel and many other steels that improve products, methods and profits throughout industry.

Galvanized Steel

Look for the STEELMARK on the products you buy; place it on the products you sell.

WEIRTON STEEL
Weirton, West Virginia

WEIRTON STEEL COMPANY

Weirton Steel is a division of **NATIONAL STEEL CORPORATION**

Weirkote will also be available in 1961 from National's Midwest Steel Division, Portage, Indiana

ALUMINUM • BRASS • COPPER • STAINLESS

One phone call to Chase

ROD users! Investigate Chase 3-Mark Free-Cutting Brass. It runs at higher speeds, avoids costly jam-ups and mis-feeding. Uniform lengths facilitate multiple-feed operations with minimum scrap. Check coupon for details.

STRIP users! Special processing of Chase S-19 Brass Strip at the mill gives this metal finer, close-grain surface. Expert handling from mill to you protects it. Check coupon for more information about Chase strip.

WIRE users! There's a special service for you ...the expert assistance of the Chase Wire Service Man. He'll tell you which of the many wire alloys we make is best for what YOU make. To see him, check the coupon.

ALUMINUM BRASS·COPPER STAINLESS

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Tel. PLaza 2-2565

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Mail the coupon at right for up-to-the-minute stock lists. And phone your next order for aluminum, brass, copper and stainless to the Chase Multi-Metals Service Center near you—for service no other company can match.

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☐ Aluminum Stock List ☐ Stainless Steel Stock List ☐ S-19 Brass ☐ 3-Mark Free-Cutting Rod ☐ Mill Products Catalog

☐ *Please have Wire Service Man get in touch with me.*

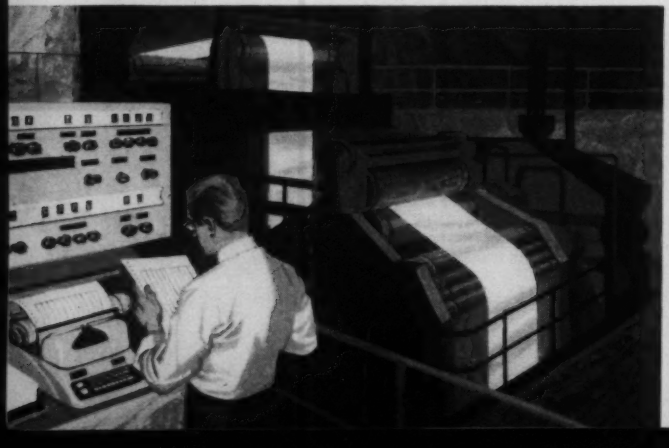
NAME & TITLE_____

COMPANY_____

STREET ADDRESS_____

CITY_____ ZONE____ STATE_____

What a memory! How do you check quality and record it on coils of tinplate up to three miles long? New Cutler-Hammer sensing, memory device does it. It's the first of its kind anywhere.



What a view! Here's a radar picture of all runways at Idlewild Airport. It's so clear you could identify a horse two miles away! Another Cutler-Hammer development.

What's new in control for automation?

An automatic warehouse that tells car bodies when to stop and go

Cutler-Hammer system directs car bodies to and from storage area for a major automobile manufacturer. The need was for a buffer storage area for car bodies between the assembly plant and the body building plant.

Before this storage area idea was conceived, car bodies went from the line of the body plant right to the line of the assembly plant. If one line had to shut down, the other did, too.

Cutler-Hammer systems control men developed the electrical control that sorts the car bodies coming from the body plant to one of eleven storage conveyors. Also, any body style can be taken off the conveyor and sent to the assembly line.

And, now? No shutdowns in one plant if the other is shut down temporarily. Any body style needed can be put on the assembly line. Couldn't be done before. So now, parts shortages affecting one body style don't affect production.

The conveyor system installed only last year is paying big dividends in reduced assembly line costs. As a result, several similar installations have been ordered.

The importance of an electrical control man. A Cutler-Hammer control man can bring wide experience to your automation planning table. He's handled many different products. He's worked with many different systems. With the proper control recommendations, many thousands of dollars can be saved.

The big change at Cutler-Hammer. You can see a change at Cutler-Hammer. We've prepared for the expected growth in the sixties with new, better products, new plant capacities, new engineering talent. If you're planning ahead, we'd like to talk to you. We could save you time and money in your automation planning. Contact the Cutler-Hammer sales office nearest you to see how.

Automation is more efficient when the control expert is called in early.

WHAT'S NEW? ASK...

CUTLER-HAMMER

Cutler-Hammer Inc., Milwaukee, Wisconsin • Division: Airborne Instruments Laboratory • Subsidiary: Cutler-Hammer International, C. A. Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.

Blast It Better!

Add bigger savings with
ARROW-BLAST abrasive*

Pressure blasting saves you time and trouble in plenty of metal cleaning jobs.

But that's only part of the economy story.

With Norton ARROW-BLAST abrasive you get other important savings. ARROW-BLAST abrasive is composed of ALUNDUM* fused alumina grains — characteristically hard and sharp for extra fast cutting action — tough, strong and blocky for high resistance to breakdown.

That's how ARROW-BLAST abrasive assures longer, more useful service life and lower cleaning costs. Also, contrasted with sand-blasting, ARROW-BLAST abrasive cleaning eliminates hazards. Dust is held to a minimum, allowing maximum visibility.

For maximum savings in compression cleaning, add Norton NORBIDE* pressure blast nozzles. Molded of the man-made material that's next to diamonds in hardness, NORBIDE nozzles last longer than any other you can buy, and give exactly the type of cleaning stream you need, from broad to pencil-thin. For quick service on ARROW-BLAST abrasive and NORBIDE nozzles, see your Norton Distributor. Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade Marks Reg. U.S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

G-402

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Your Republic Bolt and Nut Distributor Can Help You

How much time can you afford to spend keeping up on new fastener techniques? Time enough to read the dozens of trade articles published monthly on the subject? Time to study the complexities of space age fastening problems, and to talk regularly with fastener designers and engineers?

The point is, you can be well informed on these things without spending time and effort. Rely on the fastener expert who is already at your service—your Republic Bolt and Nut Distributor. He's constantly aware of all that's new and useful in the industry. And he and his staff are backed by the know-how of Republic Steel—a company whose fastener background spans a century.

Any information you might need is quickly available to you—part of your Republic Bolt and Nut Distributor's full-range service. You can count on him for fast deliveries of all types and sizes of fasteners, too—in whatever quantities you need. Call him today.

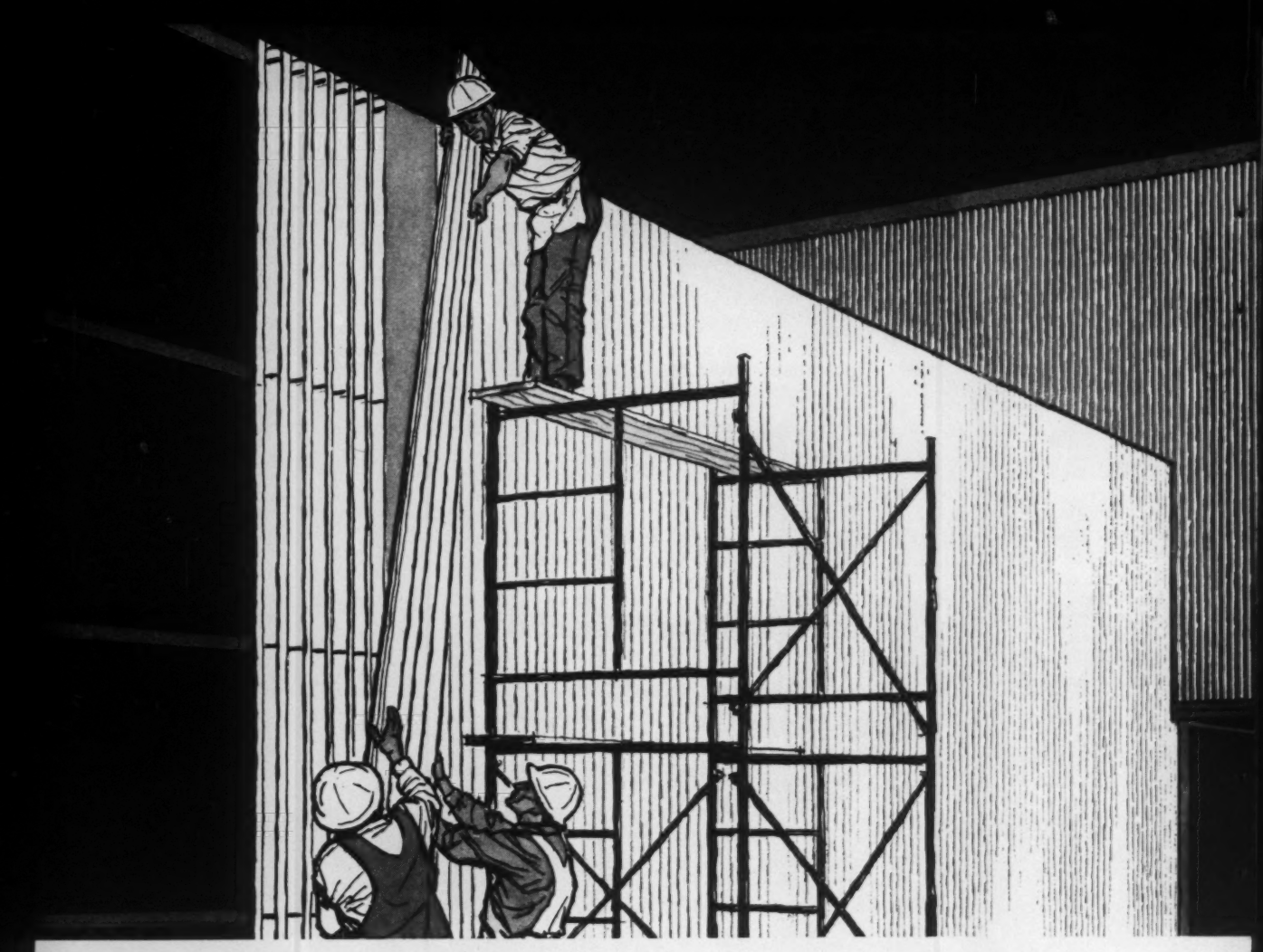
REPUBLIC STEEL

Call your local distributor for quick deliveries of...

REPUBLIC Bolts and Nuts

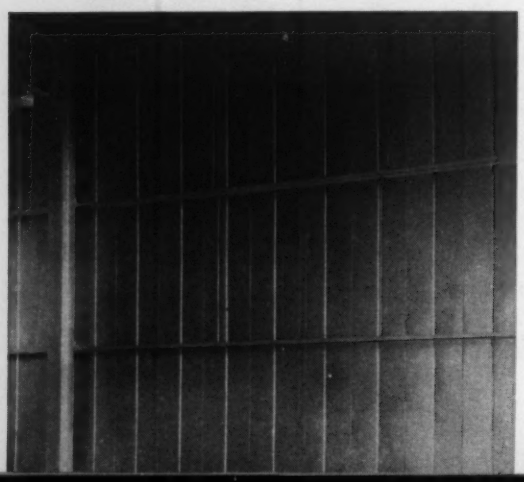
SEE OUR EXHIBIT
Steel Arena
1960 METAL SHOW
PHILADELPHIA
OCT. 17-21

BUILD IT BETTER WITH AMERICA'S STEEL



NEW TRUSCON CURTAIN WALL PANELS INSULATED OR NON-INSULATED...LOW COST FOR COMMERCIAL AND INDUSTRIAL BUILDINGS

Notice the sharp, clean interior lines presented by Truscon 24″ FERROBORD and Insulated Wall Panels.



Truscon Curtain Wall Panels, insulated or non-insulated, are the answer to fast, economical commercial and industrial housing. Architecturally beautiful to blend with modern industrial park, commercial service and shopping centers.

Truscon Insulated Panels are constructed by sandwiching a layer of insulating material between two sheets of Truscon 24″ Ferrobord® or galvanized ribbed sheeting. Panels are securely interlocked and button-punched for maximum weather-tightness. Panels are furnished painted or galvanized, in widths of 2′-0″, and up to 40′-0″ in length.

Low installation cost, very little maintenance cost, and available for immediate delivery. Call your Truscon representative, or write direct for additional data.

LOW COST SHIPPING: Republic Coil Covers speed and simplify freight handling, protect cargoes in transit, stop vandalism. Designed for use on standard gondola and flat cars. Approximately 22 feet long, 6 feet wide, 6 feet high. Two covers are furnished for each car. Heavy-duty construction, easy to handle by overhead or track-side cranes. Six specially designed stacking brackets permit easy tiering. Call your Republic representative, or send coupon.

FAST, STRONGER, SAFE, LOW COST FRAMING: Republic METAL LUMBER solves framing problems fast. Simply measure, cut, assemble, with bolt and nut fasteners. Slotted angle pattern provides greater flexibility. Ideal for custom-built storage bins, storage racks, work benches, cat-walks. Available in two gages, two widths, in standard bundles of 10- or 12-foot lengths, complete with self-locking bolts and nuts. Order from your Republic-Berger warehouse or write direct for attractive brochure and data.

LOW COST WASH AND CHANGE FACILITIES: Republic Steel Lockers are designed and built for maximum efficiency and economy. Strong, sturdy, steel construction for easy installation, long life, low maintenance. Full inside locker roominess, ventilation, safety. Bonderized. Available in many sizes, colors, and locking systems. And, Republic offers complete locker planning and installation service. Write for complete information.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
Dept. ST-1067
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on the following products:

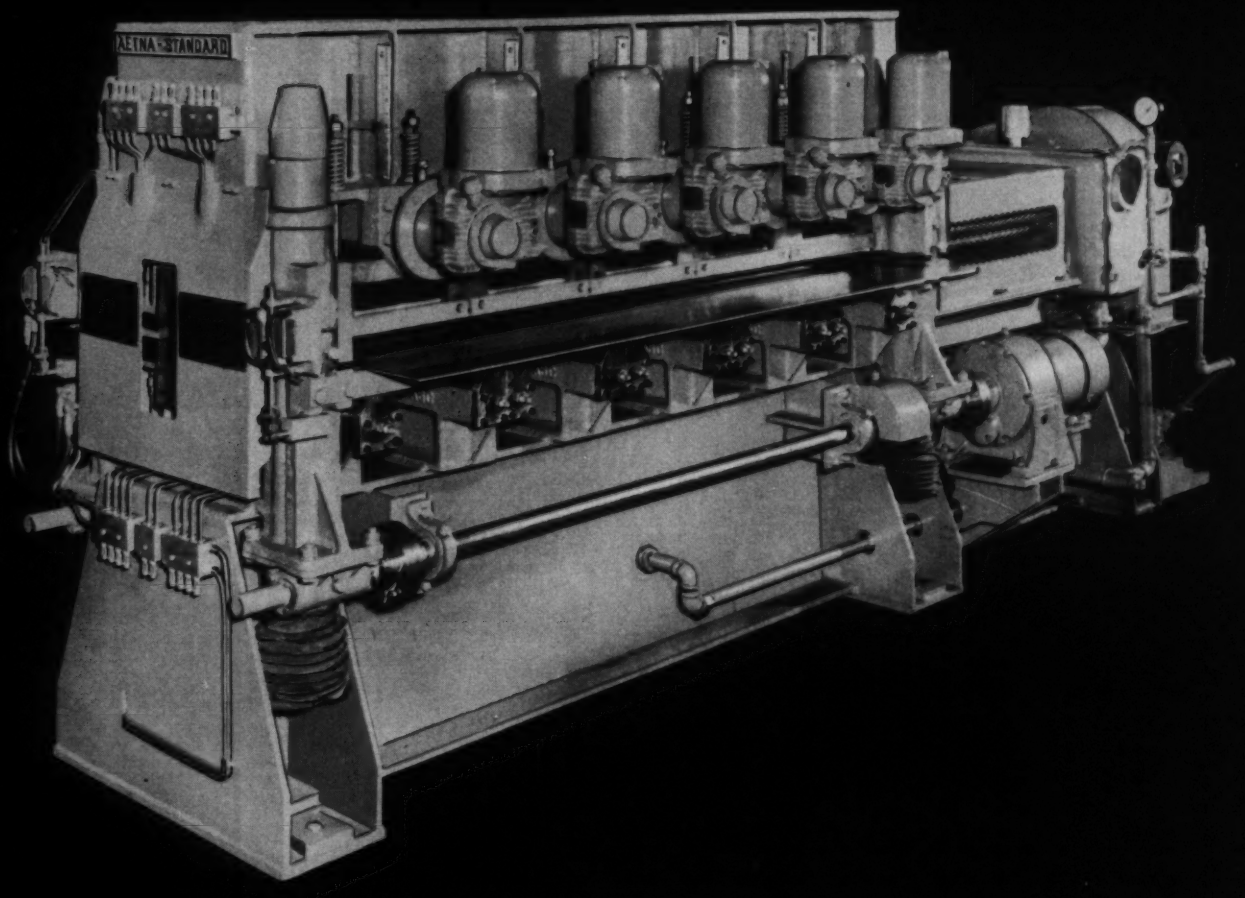
- ☐ Truscon Insulated Curtain Wall Panels
- ☐ Republic Steel Coil Covers
- ☐ Republic Steel Lockers
- ☐ Republic METAL LUMBER®

Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____



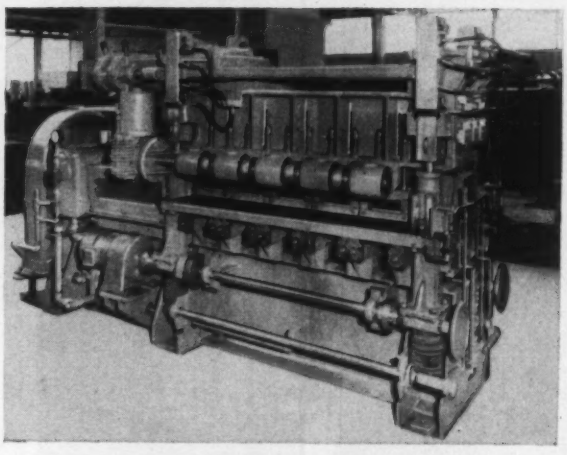
MORE WORK ON PRODUCT MADE POSSIBLE

WITH THIS

NEW ROLLER LEVELER

This new Roller Leveler, designed and manufactured by the Aetna-Standard Division of Blaw-Knox, has individual motor-operated back-up roll adjustments. The operator can easily make quick correction of product shape. The additional sets of back-up rolls make possible more flexibility of adjustment and more thorough working of the product. Motorized adjustments are also included for gauge thickness which make the unit fully equipped with power adjustments.

Leveler illustrated is 1¾" dia. x 72" face—21 rolls. Other sizes can be furnished to suit individual requirements. For detailed information on this new Roller Leveler or other Sheet and Strip Equipment, write: Aetna-Standard Division, Blaw-Knox Company, 300 Sixth Avenue, Pittsburgh 22, Pennsylvania.



AETNA-STANDARD MAKES MANY TYPES OF LEVELERS

These include 2 and 4 high Roller Levelers, Rectifier Levelers, Heavy Plate Levelers, Roller Levelers for tapered sheets.

Aetna-Standard Division

BLAW-KNOX

HAYNES ALLOYS

RESEARCH REPORTS

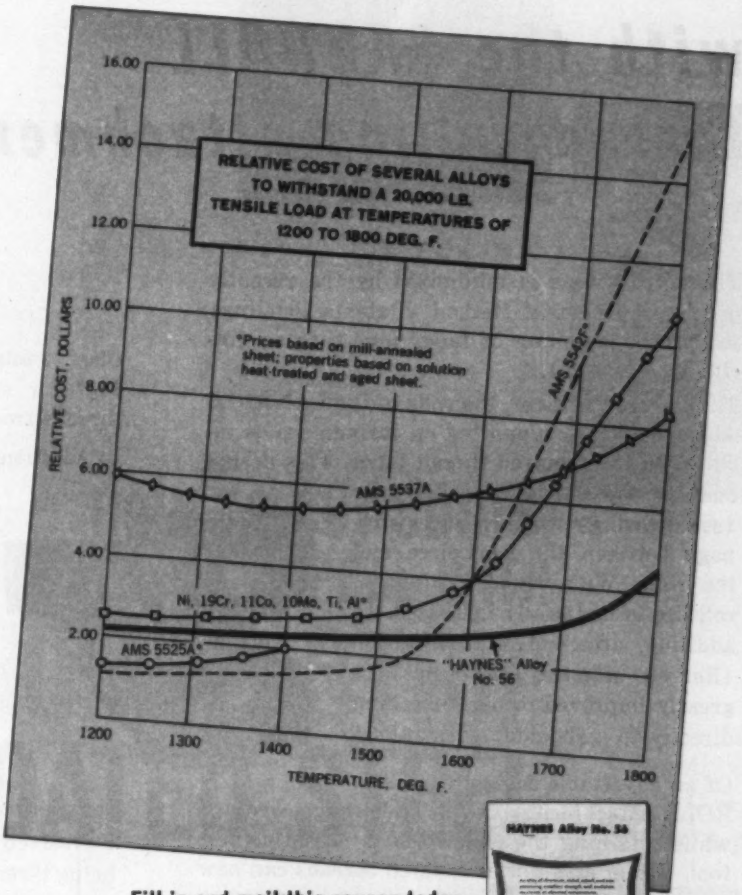
New High-Temperature Alloy Improves Cost-To-Strength Ratio

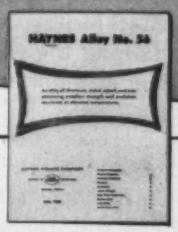
Excellent strength and oxidation resistance in the 1200 to 2000 deg. F. range are among the features of HAYNES Alloy No. 56—a new high-temperature alloy developed by Haynes Stellite Company.

A sampling of its cost advantages at a given tensile load, compared with other high-temperature alloys in the graph at the right, is well worth your study.

Alloy No. 56 can be readily hot-worked and formed. It is easy to heat treat. It comes in the form of sheet, plate, bar, wire, and coated welding electrodes, and can be furnished as sand-, investment-, and resin shell-mold castings. The coupon below will bring you a wealth of technical data.

The new iron-base alloy contains nickel, cobalt, chromium, and molybdenum. It has high strength at temperatures up to 1500 deg. F and maintains useful strength at temperatures as high as 2000 deg. F.





Fill in and mail this coupon today

Haynes Stellite Company, Dept. 51
270 Park Avenue, New York 17, N.Y.

Please mail me the free, 16-page properties-data booklet on the new HAYNES Alloy No. 56.

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

HAYNES ALLOYS

HAYNES STELLITE COMPANY

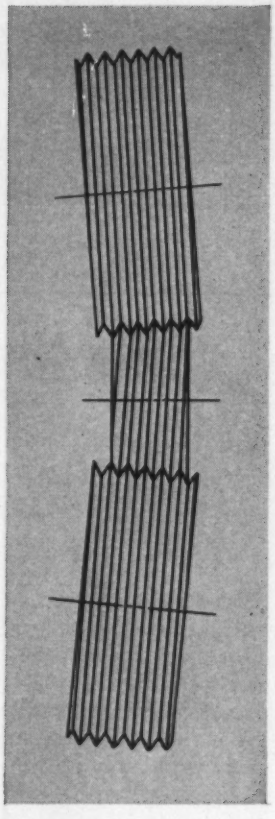
Division of Union Carbide Corporation
Kokomo, Indiana

UNION CARBIDE

Haynes" and "Union Carbide" are registered trade marks of Union Carbide Corporation.

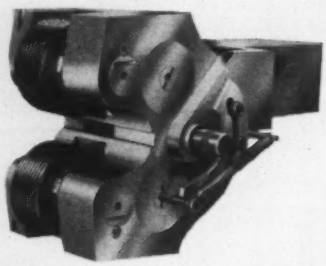
rolling taper pipe threads

with the LANROLL thread rolling attachment



Thread-roll wear is minimized by the recently developed LANDIS Method (Patents Pending) for precision rolling of taper pipe threads (including dry-seal).

To produce the taper, the rolls of the LANROLL Attachment are supported on carbide shafts inclined to the required thread taper. This design enables the use of parallel rolls (see drawing) which reduces slippage between the workpiece and the rolls. With reduced slippage, roll life is materially increased. In addition, attachment stabilization (limited sidewise movement) is greatly improved to permit rolling directly to a shoulder with safety.



Of an adjustable design, the LANROLL Attachments provide wide range coverage while retaining the rigidity of a non-adjustable tool. Either straight or tapered threads can now be produced with the same attachment through the use of proper rolls and auxiliary equipment. Five sizes with varying dimensions are available for use on the many sizes and makes of bar automatics, and will produce coarse pitch threads to Class 4 tolerances on all diameters from #5 to 1¾" for straight threads, and precision pipe threads from $\frac{1}{16}$" to 1¼" in diameter.

In addition to proper rolls, the auxiliary equipment necessary to change from straight to taper threading is negligible. When changing from one pipe size to another within the range of the attachment, the size adjusting link, set-up gage and rolls are the only equipment changes required. With this design tooling flexibility is obtained with minimum cost. These changes assure operation of the attachment for every size within its range as though it were exclusively engineered for the particular work being threaded. Also, the same simplified and precise methods of set-up and roll timing used for straight threading are used for taper threading.

For additional information ask for Bulletin G-96, and specify straight or taper work.

471

LANDIS *Machine* COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

ACCORDION DOORS

HOME MAILBOXES

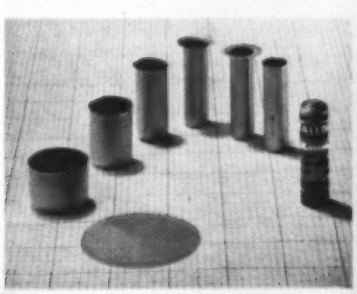
LUGGAGE LOCKS

LIPSTICK BASES

CABINET HARDWARE

HOW TO CUT COSTS, BOOST PRODUCT APPEAL WITH THOMAS STRIP PRE-COATED STEEL

please turn page



BATTERY CANS

BOILER TOPS

Pittsburgh Steel Company

Pittsburgh Steel Company

Luggage Locks—Brass Coated strip "strongly helped us compete against low-cost, brass plated imports." That's acclaim John A. Long, vice president-general manager, Long Manufacturing Co. Inc., gives Thomas Strip's brass coated steel. Long, of Petersburg, Va., is the nation's second largest luggage hardware maker. It was hard hit by foreign-made brass locks. "It was a crucial time in one of our big markets," says Sales Manager Edward C. Coleman. "We started looking for new methods and materials. Now, with new designs and using Thomas brass coated strip, we're able to fight foreign competitors." Eliminating plating and hand polishing with brass coated strip, buffed and lacquered on one side, Long trimmed 11 production steps. Result: 50% cost saving on compact-type luggage lock. Thomas Strip maintains product quality, helps Long increase die life; clear lacquer coat acts as lubricant in forming, prevents galling, and preserves product finish in inventory and in handling.

THOMAS STRIP: TRIMS METAL COSTS, SAVES PRODUCTION STEPS, UPGRADES PRODUCTS

Metal fabricators get a head start toward material and production savings with Thomas Strip's coated steel specialties.

Combining the beauty and utility of costlier metals with the strength, economy and formability of steel, Thomas Strip also offers greater product versatility, durability, buyer appeal and design potential.

Here are benefits available to you in Thomas Strip:

• **Shortens Manufacturing Cycle**—Precoated Thomas Strip is ready to fabricate when it's delivered. Initial preparation, cleaning, buffing, final finishing are already done in many cases—you're steps ahead in production.

• **Provides Economy of Steel**—By replacing more expensive metals, but retaining their finish or functional properties, precoated Thomas Strip reduces material costs.

• **Fabricates Easily**—Electrolytically applied, hot-dipped, painted or bonded, Thomas Strip coatings endure fabrication as readily as easy-to-work base steel.

• **Cuts Plating Costs**—Serving as final finish or as base for further plating or painting, Thomas Strip eliminates or at least reduces fabricators' piece-plating expense.

• **More Pieces Per Pound**—Precision rolling and plating to extremely close tolerances give maximum yield in parts per pound.

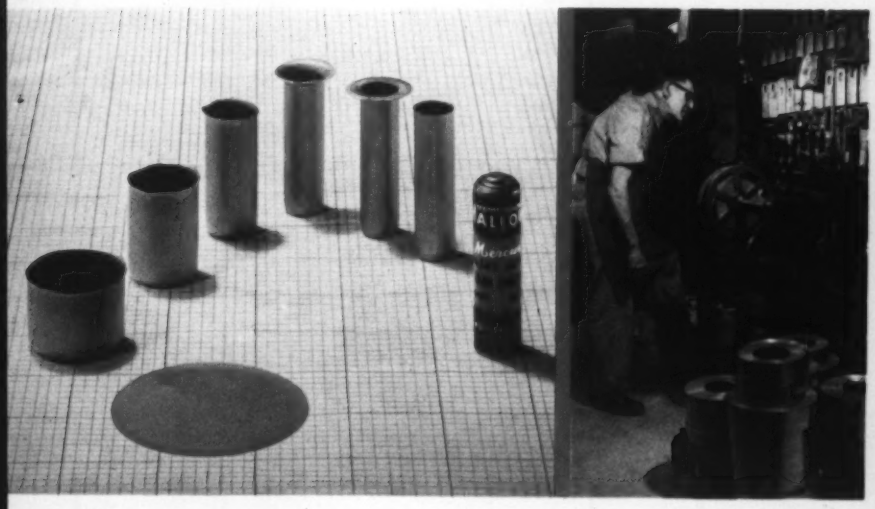
A study of the experiences of Thomas Strip users pictured on these pages should convince you of the benefits available to your product application—or to that product idea in the back of your mind. Read them.

If you need more convincing, detailed literature and samples are yours for the asking.

Better yet, contact one of the Thomas Strip District Sales Offices on the last page and ask for engineering or design help. And tell them you'd like to see our new slide film, "Bright, Modern Metals Provide Proof of the Pudding."

Accordion Doors—Plastic Coated Thomas Strip replaced hand laminating for "lead rail" of STEELITE plastic folding doors made by Clopay Corporation, Cincinnati, Ohio. Strip is roll formed with six 90° bends, ribbed and punched for rivets and door handle. Plastic endures stretching and compression. Also maintains "perfect lamination" to pass 100% inspection, says Purchasing Agent Lewis H. Washburn. Formed rails (left foreground) are assembled on rivet bench.

Boiler Tops—Lacquered Strip is spun formed by Edwards Engineering Corp., Pompton Plains, N. J., for boiler tops and top collars in packaged heating systems. Lacquer coat on Thomas Strip's aluminum-killed, drawing quality steel adheres without chipping or peeling. Edwards also uses lacquered strip to roll form back plates and front shields for baseboard units. Purchasing Agent John Bush says: "Thomas is more flexible and cooperative in giving us a quality product. We cut six steps, gained 1,500 sq. ft. of work space and eliminated fire hazards when we switched to prepainted strip. But most important, we can custom cut baseboard units to extra long lengths from prepainted coils." Edwards buys .029″ strip lacquered white on one side in 10.500″ and 5.625″ widths; 23″ width, beige lacquered on two sides.



Battery Cans—Nickel Coated Thomas Strip is used by Cly-Del Manufacturing Co., Waterbury, Conn., to produce mercury battery cases for P. R. Mallory Co. Example: RM-502 inner can, drawn by an Eyelet process from 2¼″ by .010″ strip. AK, non-scalloping steel with .000125″ nickel coat both sides must produce can 1.776″ by .506″ O.D. without draw rings, burrs, earing, peeling or flaking. Thomas has supplied nickel coated strip to Cly-Del nearly 20 years. "Precoated strip does this job better than if we plate after forming," says Purchasing Agent Raymond W. Drufva. "There's not much competition for Thomas in nickel coated strip for close tolerance work. It's the only producer able to supply the material we need for these battery cans."

Lipstick Bases—Copper Coated strip means a ⅔ material cost saving for Truelove & Maclean, Inc., Waterbury, Conn., Eyelet stampings specialists. Normally a brass part, a single style of this drawn shell, is produced at rate of 5 million yearly. Firm buys AK, non-scalloping, close gage (±.0005″) copper coated Thomas Strip for ductility, die lubricating and finish plating properties. Co-owners Tom Truelove and Don Maclean say: "We wouldn't attempt some of these jobs unless the material was copper coated steel. Generally it's no harder to work steel than brass when the steel is Thomas Strip's copper coated. There's not much competition for Thomas in this line." (Top photo shows copper coated lipstick bases being packaged with magnetic lifter.)

PATTERN ROLLED STEEL OFFERS UNLIMITED DESIGN OPPORTUNITIES

Home Mailboxes—Pattern Design. The Lady was looking for product appeal. She found it in pattern design sheet from Pittsburgh Steel Co. The Lady is Miss Jeanette L. Troy, director of purchases for The Randall Co. of Cincinnati, Ohio. She explains: "We were trying to find something new for our colonial style home mailboxes—a decorative effect that was different. Pittsburgh Steel's Pattern Design No. 101 gave us the appeal boost we were looking for—and without a proportionate cost boost."

Randall, a division of Textron Inc., produces the boxes for another Textron division, Wagner Manufacturing Co. of Sidney, Ohio. Industrial Engineer Wade Hartman says pattern design sheet saves 50 cents over a mailbox made of similar patterned materials. Rolled-in leather design shows no distortion in forming; permits full thickness of steel to be used in blanking, forming machines. Randall buys pattern sheets in commercial quality .024" thick and in widths 39⅝", 40¼", 42⅞".

Cabinet Hardware—Pattern Design—Thomas Strip's antique patterned steel helps Ajax Hardware Corporation of Los Angeles build strength and beauty into Early American cabinet hardware. President Norman D. Louis says: "Thomas Strip saves many hours by eliminating production steps. The uniformity of appearance, quality and workability of Thomas Strip's patterned steel makes it possible to match Ajax Early American cabinet hardware year after year. Production is fast because of Thomas Strip's close tolerances and formability." Ajax Hardware gives Thomas Strip's uncoated strip an electrolytic coating of rich antique copper or dull black. Photo shows packaging operation.

THOMAS STRIP DIVISION

Pittsburgh Steel Company

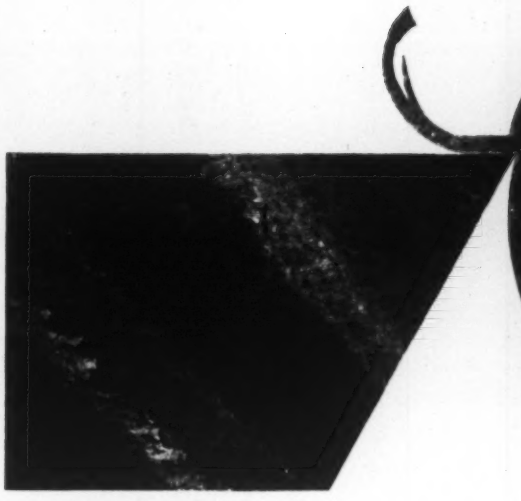
Grant Building • Pittsburgh 30, Pennsylvania

Steel

The STEELMARK on a product tells you it is made of steel. Look for it when you buy.

DISTRICT SALES OFFICES

Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio



Packaging Corporation of America:

"Would Make The Same Choice Again"

LODGE & SHIPLEY
POWERTURN

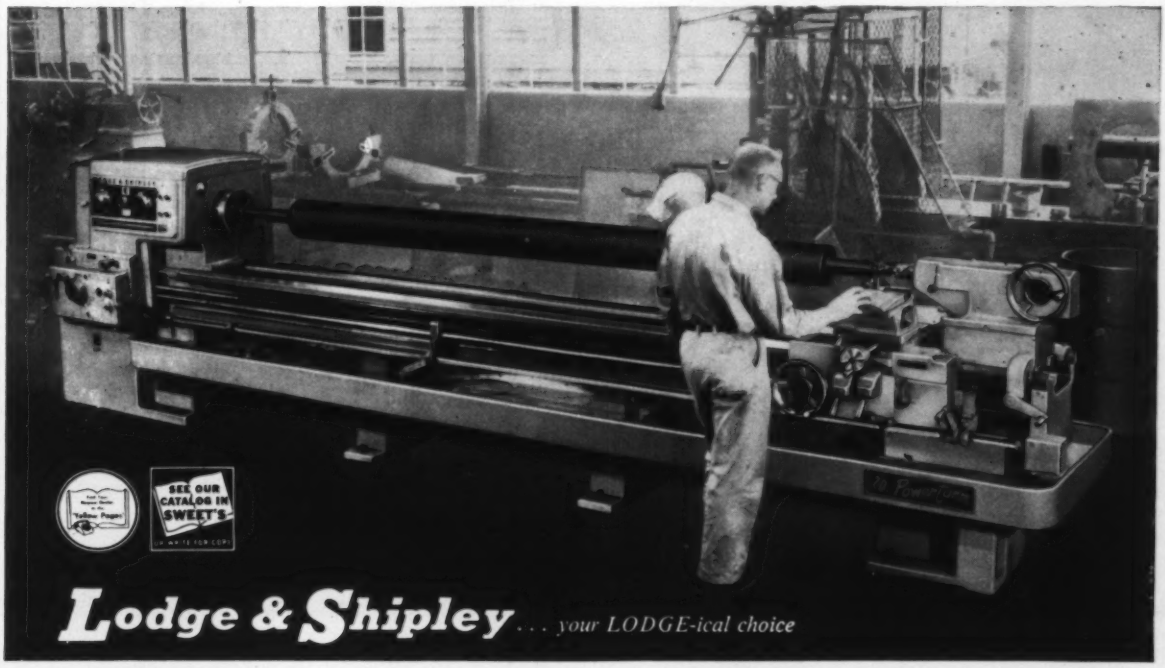
POWERTURN fits perfectly in the shop requiring the utmost in engine lathe performance. It pays its way every day with genuine versatility, giving accuracy in a wide selection of feeds and speeds required for a multiplicity of jobs.

Here's proof . . . in an installation at Packaging Corporation of America's Filer City (Mich.) Mill, where the shop foreman comments: "Every type of work is within the capabilities of this lathe" . . . "its accuracy is excellent, meets our most rigid requirements."

The POWERTURN Engine Lathe combines power and stamina with the most up-to-date features for precision and operating convenience . . . the qualities which have characterized Lodge & Shipley's 62-year history of users who "would make the same choice every time."

Whatever your turning requirements, consider Lodge & Shipley lathes: the best machine for a specific job or the greatest versatility for many jobs.

Write: Lodge & Shipley, Dept. L-107, 3070 Colerain Ave., Cincinnati 25, Ohio.



Lodge & Shipley . . . *your LODGE-ical choice*

FOR QUALITY PRODUCTIVITY ... PROFIT

INTEGRATED AUTOMATION BY GENERAL ELECTRIC

G. R. BROWN, Manager of General Electric's Metal Rolling and Processing Sales, talks about new automation capabilities at General Electric.

Integrated Automation

"General Electric is ready now to assist you with the ultimate in automation . . . automation of your entire plant."

To date, General Electric has concentrated on the complex problems of automating your individual processes. Now, with actual installations completed, individual-process automation has become a reality. General Electric has now taken the next logical step in sound automation planning.

With newly developed products and system technology, General Electric engineers can now link your "islands of automation" to provide complete automation of an entire production area.

With this major phase of your automation program complete, it then becomes possible to link automated production areas by means of a master computer-control system, thus providing completely integrated automation of the entire plant.

Based on a step-by-step modernization approach, General Electric's plan provides flexibility for technological and economic developments in your company. At the same time, it enables you to begin now, taking advantage of the many benefits of automation.

For example, the first step in integrated automation has already been taken by many metal producers. New rolling mills automated by General Electric are automatically keeping strip "on gage" to minimize scrap and boost yield. Primary rolling costs are being reduced through application of G-E programming and

means effective control of your entire plant

computer systems. G-E automated systems will eliminate charging errors in many blast furnace operations, increasing furnace profits. In many mill operations, G-E automated systems are making available, immediately, critical data in the most usable form to permit wise and timely management decisions resulting in improved and more consistent product quality, reduced operating costs and optimum utilization of the mill.

The next step for many of these metal producers will be the linking together of "islands of automation." By application of General Electric automatic computer-control equipment, greatly improved programming for an entire sequence of processes will result. All operations can then be effectively measured and evaluated early enough to allow modifications that will quickly satisfy conditions in any individual process. An entire production area will become responsive to directives originating from a central source.

Finally, as production areas are linked by a master computer-control system, completely automatic production scheduling and manufacturing throughout the entire plant will result. Over-all performance will be in direct accord with management decisions based on incoming orders, related process operations, materials inventories and all of the many complex variables that determine profitable plant operation.

Let General Electric begin working with you now in your planning for future profits. You'll find that the capability to provide the ultimate in automation is a reality at General Electric today. For more details, call your nearest Apparatus Sales Office. General Electric Company, Section 659-131, Schenectady 5, New York.

AUTOMATION THROUGH MODERNIZATION

GENERAL ELECTRIC

How Greenlee Bros., Rockford, Ill., Saved $19,600 in 12 Months with An AO Protection Program

GREENLEE BROTHERS, ROCKFORD, ILLINOIS installed a complete compulsory eye protection program in 1959. The investment quickly paid off in dollars and cents as well as bettered morale, pain-prevented, sight savings, skills protected. And remember, most of the first year's cost of $14,237 is non-recurrent.

VITAL STATISTICS

- 64% reduction in workers making trip to nurse.
- 51% reduction in workers making trip to doctor.
- 90% reduction in lost time hours due to serious eye accidents.
- 3 Eyes Saved*

  *Actually 11 eyes, but 8 of the accidents occurred in the foundries. These were previously covered.
- $19,600 estimated savings.

What plant investment pays off as rapidly? Send for new brochure, "Eyes Are Expensive Targets".

American Optical COMPANY

SAFETY PRODUCTS DIVISION
Southbridge, Massachusetts

Safety Service Centers in Principal Cities

Always insist on AO Trademarked Safety Products

Your Surest Protection . . . AO SURE-GUARD Products

New Roebling Wide Width Tempered Spring Steel makes the most of a good thing

. . . (your money, for instance!)

You count your profits in the number of holes in your scrap. And spring steel that doesn't measure up to the most good parts per inch just isn't the right steel for you.

That's why everybody's talking about new Roebling tempered, cold rolled spring steel. Comes in *any* width up to a full handspan wide. 8⅛ inches, that is, by .005 to .062 inches thick. Think how useful that unique extra width can be in getting extra blanks from a length of steel! The thickness is consistent, too.

Now pick a finish – any finish – blued, straw, or bright – plain or ground, Roebling's got it. Buy Roebling Cold Rolled Spring Steel and you get uniform excellence in temper and finish. Delivery? No problem at all. Get full facts and figures by writing Roebling's Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation

Flash butt-welding an extruded section resulted in a 65% material reduction

By specifying an extrusion that allowed only a thin envelope of material around the finished cross-section, Amweld engineers saved 37 lbs. of 321 stainless—and eliminated considerable machining time. Amweld flash butt-welding know-how produced a ring that more than satisfied the critical strength requirements for this jet engine shroud.

Amweld is equipped to supply flash butt-welded rings and circular products in stainless, titanium, aluminum, as well as a wide variety of corrosion-resistant alloys. If you would like to know more about Amweld's welding, fabricating and machining facilities, phone or write.

GET THE FACTS ABOUT AMWELD

New 20-page catalog describes flash butt-welded rings and circular products manufactured by Amweld. Also booklet entitled, "How Flash Butt-Welded Rings are Made."

AMWELD® INDUSTRIAL PRODUCTS

THE AMERICAN WELDING & MFG. CO. • 110 DIETZ ROAD • WARREN, OHIO

1961 Construction to Top 1960's

Look for 1961 construction activity to top the 1960 total by 2 per cent, hitting $56.95 billion. That's what Thomas F. Mitchell, marketing research analyst, told the American Marketing Association last Tuesday. Here are his predictions (dollar figure is total for 1961; percentage is change from 1960):

(Billions of dollars)

Total private	$39.4	− 1%	Total public	$17.6	+10%
Residential	23.2	+ 1%	Residential	1.1	+33%
Industrial	2.3	−14%	Industrial	0.4	—
Commercial	4.0	− 5%	Educational	2.7	—
Farm	1.0	−13%	Institutional	0.5	+25%
Utilities	5.2	− 3%	Administrative	0.6	+ 4%
Other	3.7	+ 4%	Other public	12.4	+11%

1961 Steel Output to Fall Short of This Year's Mark

Look for 1961 steel production to total between 99 million and 103 million ingot tons (vs. 106 million this year), predicts W. L. Moore, director of commercial research, Jones & Laughlin Steel Corp. He told the Cleveland Chapter of the American Marketing Association that production will about equal consumption in '61. He believes auto production will drop to 5.8 million units next year. He thinks steel exports and imports will be in balance at 3 million tons each. (For other forecasts, see Page 65.)

J&L Is Ready for Nuclear Attack

Jones & Laughlin Steel Corp. has set up a plan for survival in the event of nuclear attack, R. L. Wheland, co-ordinator of industrial defense, told the American Society for Industrial Security in Dallas. If only one board member is available, he is empowered to fill vacancies in the board and among corporate officers. Employees have been trained in first aid, rescue, fire and police protection, emergency repairs, and communications. Nine emergency reporting centers circle Pittsburgh, where employees will report following a disaster. Each center has a special locked cabinet containing phonebooks, personnel manuals, emergency payroll checks, and instructions. An emergency headquarters is located more than 30 miles from each target center. It contains an underground vault, office, feeding and sleeping facilities.

Builder Says Depreciation Policies Hurt National Security

With Russia poised to enter the international machine tool market on a grand scale, the U. S. government has virtually handcuffed this vital U. S. industry with outdated tax writeoffs, H. H. Whitmore, executive vice president, Jones & Lamson Machine Co., told an audience at The Machine Tool Exposition—1960. He says our depreciation policies are creating "a dangerous state of obsolescence in America at a time when the rest of the world, and

particularly the Soviet Union, is surging ahead." He estimates an increase of $5 billion to $7 billion annually in depreciation allowances is needed to close the gap between present allowances and the total normally needed to finance capital expenditures that provide jobs.

Older Workers Find More Job Openings

Workers in the 45 to 65 age bracket are finding jobs more easily than they did several years ago, the National Association of Manufacturers reports. The NAM queried 70 leading companies, found that 58 per cent of the firms declared their pension plans do not affect their hiring of older employees. Another 30 per cent said they could include no one in their pension plans until he had been employed five to ten years. The rest said they hired older workers but did not include them in their pension plans. The NAM reports that more employers are recognizing the advantages of hiring the older worker.

Steel Work Rules Study May Miss Deadline

The labor-management committee studying the steel industry's work rules will have trouble meeting its Nov. 30 deadline to present recommendations. Thus far it has held only three meetings, strictly exploratory. Look for a time extension if the target is missed.

1847 Foreigners Attend Machine Tool Show

The paid attendance ($3 each) at The Machine Tool Exposition—1960 in Chicago exceeded 80,000. That figure includes 1847 visitors from outside the U. S.—more than twice the number that attended the 1955 show. One Russian showed up but was promptly ejected by the U. S. government. Here's the number that attended:

Argentina 91	Denmark 8	Japan 214	Scotland 6
Australia 28	England 148	Mexico 93	Spain 4
Belgium 13	Ecuador 1	New Zealand .. 1	Sweden 56
Brazil 76	Finland 1	Norway 5	Switzerland 48
Canada 648	France 91	Pakistan 1	South Africa ... 3
Ceylon 1	Germany 143	Peru 1	Turkey 2
Chile 3	Holland 11	Philippines 2	Uruguay 2
Colombia 20	India 19	Poland 1	Venezuela 7
Czechoslovakia . 1	Italy 87	Russia 1	Yugoslavia 9

Consumers Regain Some Confidence

The deterioration in consumer sentiment that took place between February and June has been arrested, but no "decisive" change for the better has yet occurred. So concludes the University of Michigan's Survey Research Center after its latest Index of Consumer Attitudes. The consumers queried generally feel that the short term business picture is not good, but that the long term outlook is excellent. Most say their personal finances are better now than they were a year ago, but many expect to be worse off later on. Buying intentions for houses, cars, and appliances show practically no change from the May level. A sizable proportion of persons planning to buy new cars say they are looking for compact cars.

Engine to Double Space Payloads

This fluorine-hydrogen rocket engine paves the way for the U. S. to double the payload of space and orbital vehicles, claims Bell Aerosystems Co., Buffalo. The turbopump-fed rocket engine, using liquid fluorine and liquid hydrogen as propellents, has been test fired. Bell engineers report they encountered no major difficulty in working with 40 tons of liquid fluorine which must be stored at −306° F to maintain it in a liquid state.

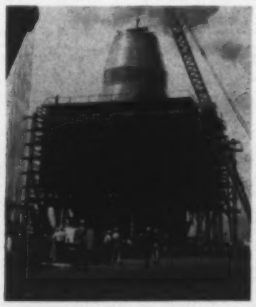
GE Cuts Numerical Control Prices

General Electric Co. will cut the price of its numerical positioning controls by about 10 per cent, effective Oct. 1. D. O. Dice, manager-marketing, Specialty Control Dept., gives three reasons for the reduction: 1. Cost savings through quantity production. 2. Production efficiency (GE uses numerically controlled machines to make the controls). 3. Confidence in a "tremendous future market" for automated machine tools.

Canada's PAs See No Hike in Steel Prices

Canadian purchasing agents see little likelihood of an over-all steel price rise until "at least late in 1961," the Canadian Association of Purchasing Agents reports. Price cuts on manufactured steel products have become more widespread in the country and Canadian steel mills are concerned about foreign competition. English and continental European mills are selling in Canada, and Japan is trying to crack eastern Canadian markets. Some Canadian mills are fighting hard for tariff protection.

Nuclear Aircraft Carrier to Be Launched



The *Enterprise*, nuclear aircraft carrier, is getting its last major exterior part, an aluminum dome, in the photo. The ship was launched Saturday (Sept. 24) by Newport News Shipbuilding & Dry Dock Co. The ship will weigh 85,350 tons, be more than 1100 ft long, and as high as a 23-story building, including the four-story aluminum dome (which will house electronic equipment). The *Enterprise* will contain more aluminum than any other naval vessel, says Reynolds Metals Co.

Our Foreign Trade Picture Improves

U. S. exports for 1960 may reach $19 billion, up $2.7 billion from 1959. Imports will probably total about $15 billion, roughly the same as last year. So believe economists at the Federal Reserve Bank of Chicago. That would put the U. S. balance of payments deficit for 1960 around $2.5 billion (vs. $3.8 billion last year and $3.5 billion in 1958). The bank cautions, however, that the recent buoyancy in our exports has reflected unusually large cotton exports and the delivery of commercial jet aircraft to Europe, plus brisk de-

mand for industrial machinery abroad. Since those developments aren't likely to be repeated, U. S. businessmen will have to sell harder to match this year's showing in 1961.

Gases Are Fuel for New Regenerative Power System

The Tapco Group, Thompson Ramo Wooldridge Inc., Cleveland, has developed a regenerative fuel cell for space and ground use under the auspices of Wright-Patterson Air Force Base. The fuel cell uses lithium and hydrogen gases which act much like electrodes in storage batteries to generate power. The system can produce 200 to 2000 watts of electricity for 60 days to a year. Requiring no fuel storage, it is one-sixth lighter than comparable nonregenerative systems.

AS&W Combines Market, Product Development

American Steel & Wire Div., U. S. Steel Corp., will combine market development and product development under one man within the next month, an official of the firm told STEEL. In doing so, AS&W hopes to come up with new ideas to enlarge its share of traditional markets and to find new uses for wire and wire products. The new department will help customers and customers' customers to design wire into their products economically. Much of the division's research budget will be set aside for specific development work.

Straws in the Wind

The net working capital of U. S. corporations increased $500 million during the second quarter (to $131.2 billion), the Securities & Exchange Commission reveals . . . A. S. Glossbrenner, president, Youngstown Sheet & Tube Co., looks for the steel industry to operate at 65 to 70 per cent of capacity during the fourth quarter . . . The International Bureau of Weights & Measures in Paris has selected a Toshiba (made in Japan) light bulb as the world's standard for measuring the brilliance of electric light . . . Sales of collapsible metal tubes during the first half rose nearly 2 per cent to 594 million units . . . Reynolds International Inc., subsidiary of Reynolds Metals Co., will help build a $75 million, aluminum producing facility in Greece. Reynolds will hold 17 per cent equity in the project and have the right to market 35 per cent of the plant's output.

Metalworking Pulse

The Business Trend: Nearly all of the Labor Day loss was regained in the postholiday upturn. At a preliminary 146, STEEL's industrial production index is just 1 point below the late August level. **Autos:** The 1961 model runs on all makes except Thunderbird and Lincoln are well underway. New car stocks are still high, but production cutbacks to date have been minor. **Steel:** Production has held unusually steady since the July 4 holiday, averaging 1,513,000 tons a week.

- **INDUSTRIAL PRODUCTION**
  Week ended Sept. 17 . . . **146†**
  Year ago **111**
  Details on Page 83

- **PASSENGER CAR PRODUCTION**
  Week ended Sept. 24 . **125,000***
  Year ago **91,341**
  Details on Page 80

- **INGOT PRODUCTION RATE**
  Week ended Sept. 25 . **53.9%†**
  Week ago **53.0%**
  Details on Page 154

†Preliminary. *Estimated.

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From a small furnace to a tall furnace Hevi-Duty helps you find the value solution to your heat treating problems

Each of the Hevi-Duty furnaces shown below delivers the value solution to a heat treating problem—the solution combining comprehensive design and industrial engineering with soundly built and tested equipment—the solution that pays off in increased production and extended economic life of equipment.

In each case, Hevi-Duty drew from its experience in solving thousands of industrial heat processing problems for all types of applications.

In each case, Hevi-Duty offered equipment from industry's most complete line of electric and fuel-fired furnaces and ovens. (Where stock designs or adaptions won't do, Hevi-Duty custom-engineers equipment—from laboratory furnaces to huge field-assembled furnaces.)

Case histories by the hundreds testify that it makes profitable sense to call in your Hevi-Duty sales engineer to help find the value solution to your heat treating problems.

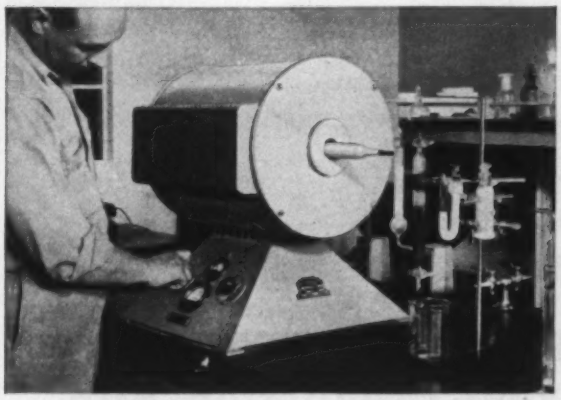
HEVI-DUTY

Electric and Fuel-Fired Industrial Furnaces and Ovens

B P C

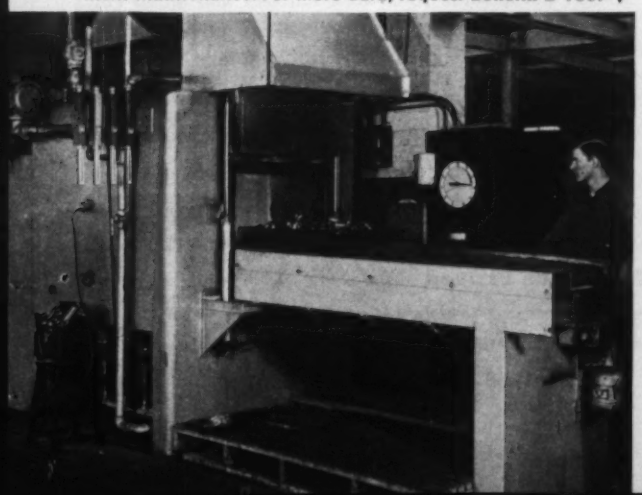
A Division of Basic Products Corporation

Hevi-Duty Electric Company, Milwaukee 1, Wis.



▲ *Merit Corp., Milwaukee, Wis., uses a Hevi-Duty tube furnace to maintain precise temperatures in laboratory quality tests on briquettes used by foundries as an additive to gray iron melts. Two-stage combustion operation on crushed sample burns off free carbon at 1679°F, total carbon at 2471°F.* **For more complete information, please write for Bulletin 254.**

Superior Metal Treating Corp., Muncie, Ind., uses two Hevi-Duty automatic Clean-Line furnaces 24 hours a day, 5 days a week for carburizing, carbonitriding and bright hardening. Temperatures range to 1925°F. The load-transfer mechanism is outside the heating chamber, reducing equipment maintenance. **For more data, request Bulletin D-100.** ▼



This Hevi-Duty traveling, double-end, box furnace provides ±10°F control at temperatures to 1850°F for bright tempering and stress relieving stainless steel jet engine weldments. This furnace is in continuous operation. User reports brightness improves during process. Unit provides bell-furnace mobility despite lack of head room. **Please write for Bulletin 653.** ▼

Here 2100 lb. *LPR's reduced downtime frequency by about 86%; slashed scrap loss proportionately; stepped up production 12 to 15%.

High-density *LPR's cut storage space 50%. By contrast notice sprawling heap of 300 lb. coils in right background. Unloading time reduced 82%.

Photos courtesy: The Frank F. Taylor Co. (Taylor Tot People) Norwood, Cincinnati, Ohio

Brite wire fabricators report these savings from DSC-PORTSMOUTH Long Production Run

*LPR COILS

HIGH-DENSITY *LPR's weighing from about 1200 to 4200 lbs. cost no more than comparable gauge and grade brite wire in traditional 150 to 400 lb. bundles. *But see what they save you in fabricating.*

***LPR's FEED UP TO 28 TIMES MORE WIRE PER SET-UP** —in single-length run—eliminating up to about 95% of production stoppages due to coil changes and set-up adjustments . . . They shrink your downtime, minimize your coil-remnant scrap.

THEY INCREASE YOUR NET OUTPUT per man-hour or per shift; cut your unit fabricating costs; save material. They widen your manufacturing margin, strengthen your competitive position.

WHAT'S MORE . . . high-density packaging (greater weight per cubic foot) conserves your storage space; makes your coil stock more accessible; sharpens your inventory control; cuts your handling time, expense and effort in shifting bundles from unloading platform to stock room—to production floor—to machine. Rids you of bothersome returnable carriers and small coil racks.

THE PROOF? We'll gladly present the details . . . or you can convince yourself by a job-test under your own operating conditions. *We'll help you set the stage* . . . For immediate action call your nearest DSC Customer "Rep" or write: DETROIT STEEL CORPORATION, BOX 7508, DETROIT 9, MICHIGAN.

Customer Satisfaction—Our No. 1 Job

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DETROIT STEEL

Flat Rolled and Wire Products

Higher Steel Prices?

Will there be a steel price increase late this year?

At the moment there are strong arguments against it.

The steel industry is still struggling with the problem of too much capacity in relation to demand. Operations remain under 60 per cent, and the chances for a 70 per cent average rate in the fourth quarter are growing more remote.

Competition from other materials is becoming more intense, with the result that prices of some items, such as stainless steel, have gone down, not up. Imports are also plaguing the industry, but fortunately, they are shrinking.

There are stronger arguments for an increase.

Despite low operating rates, the industry expects to have its fifth best year in terms of total production. Even so, some companies are in the red.

Wage costs in the first half of 1960 were 11.3 cents an hour higher than they were in the first half of 1959. They will rise further on Dec. 1, when base wage rates go up 7 cents an hour and the increments between 31 job classifications increase 0.2 cent to 6.9 cents an hour. A similar increase must be absorbed Oct. 1, 1961.

In addition to the heavier wage burden, the industry must pay for a needed modernization job it is just starting. In paying for new equipment, several companies have had to raise money through large borrowings and additional equity financing.

While updating its facilities, the industry must also maintain its obligation to stockholders by paying them reasonable dividends.

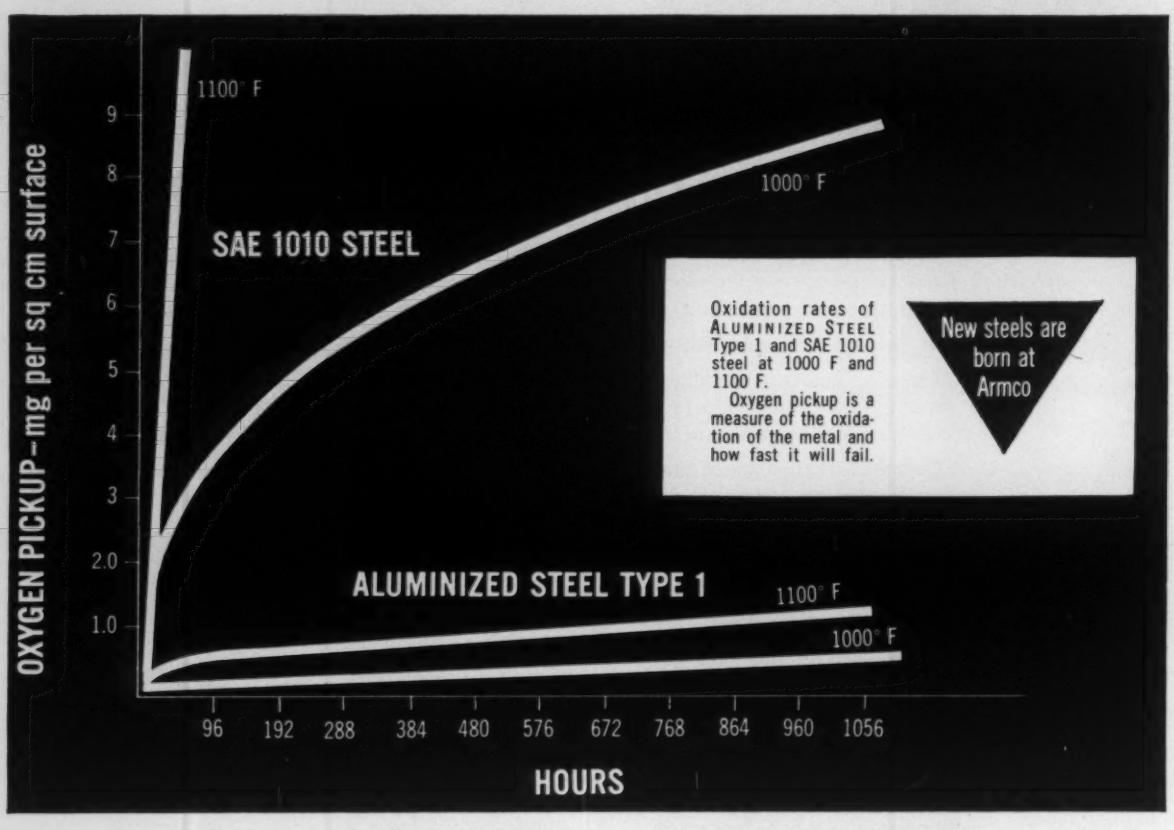
We know that the steel industry feels it should get more money for its products if it is to remain strong and healthy.

In view of all the circumstances, we think you should not overlook the possibility of a steel price increase around Dec. 1.

Irwin H. Such

EDITOR-IN-CHIEF

WHY AND WHERE ARMCO COST-CUTTING RESISTANCE



These oxidation rate curves show one important reason why Armco ALUMINIZED STEEL Type 1 is so useful for parts that must resist heat. Its hot-dip aluminum coating, applied by a special Armco process, prevents oxygen from scaling the metal at temperatures to about 1250 F.

This union of steel and aluminum also gives you other key advantages that mean better products and lower costs. **High heat reflectivity**—at temperatures to 900 F ALUMINIZED STEEL reflects about 80% of incident radiant heat.

Resistance to corrosion—The special aluminum coating withstands the attack of combustion products and condensates as well as heat.

High strength—The steel base of ALUMINIZED STEEL provides design-simplifying, cost-cutting strength and rigidity in service at temperatures as high as 1250 F.

Low Cost—For only a few cents a pound more than cold-rolled steel, you get a two-in-one metal of proved economy for parts that must resist both heat and corrosion.

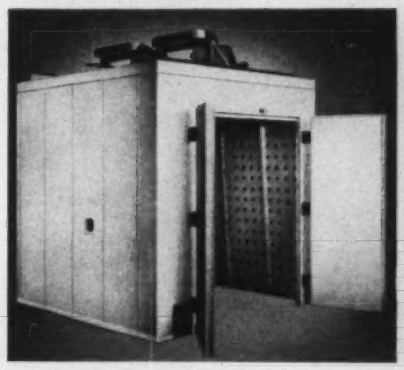
This versatile aluminum-coated steel provides advantages offered by no other metal. Design its ability to resist heat and corrosion, its heat reflectivity, its strength and economy into **your** products. Write us or mail the coupon for complete information on the properties, fabrication and use of Armco ALUMINIZED STEEL Type 1.

ARMCO STEEL CORPORATION
2440 Curtis St., Middletown, Ohio

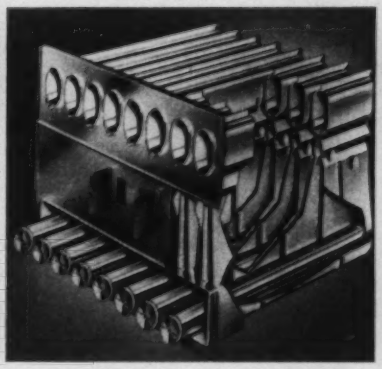
Send me complete information on Armco ALUMINIZED STEEL Type 1 for the following applications:_____

NAME_____ TITLE_____
FIRM_____
STREET_____
CITY_____ ZONE____ STATE_____

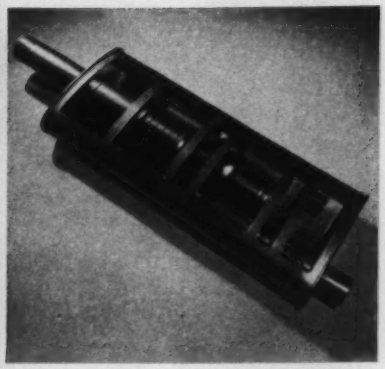
ALUMINIZED STEEL TYPE 1 ASSURES TO HEAT AND CORROSION



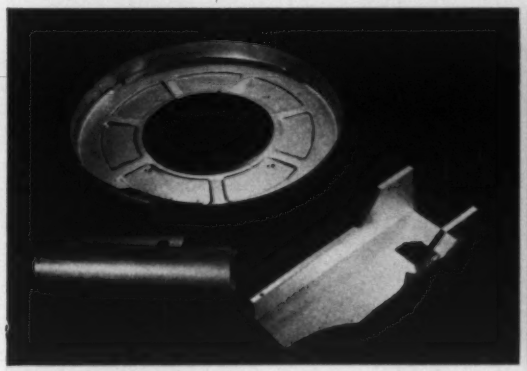
Industrial oven



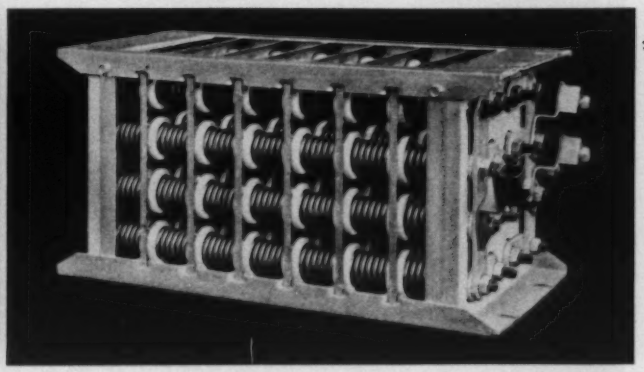
Heat exchanger



Automobile muffler



Laundry drier elements



Electric resistor

The unique combination of properties possessed by ALUMINIZED STEEL Type 1 makes it an effective material in a wide range of applications. For example, manufacturers of appliances such as electric toasters and laundry driers, industrial ovens, and restaurant equipment, use it primarily for its heat reflectivity and corrosion resistance.

In automobile and truck mufflers, the excellent resistance of ALUMINIZED STEEL Type 1 to the combination of heat and corrosion results in greatly extended service life. Use of this metal for the mufflers of many makes of cars is sound proof of its durability and economy.

The ability of ALUMINIZED STEEL to resist oxidation at temperatures to about 1250 F, and to ward off corrosion by condensates and combustion products, has enabled producers of gas and oil fired heaters to achieve greater efficiency and durability at low cost.

For industrial and consumer electric heaters, high heat reflectivity combined with the corrosion resistance and structural strength of this special Armco Steel has meant manufacturing economies plus reliable service.

In addition to these typical applications, Armco ALUMINIZED STEEL Type 1 is specified for many other commercial, industrial and consumer products because it yields new sales advantages and greater durability at lower cost.

ARMCO STEEL

ARMCO

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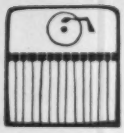
(Inland "job-tailored" Cold Rolled Sheets)

UNIFORMITY

To a dancer, uniformity of performance is essential. Her very reputation and success depend upon it. Steel users, too, are equally concerned, both with consistently high standards for their products, and with the dependable uniformity of the materials from which their products are fabricated.

That's why so many users of steel specify Inland Cold Rolled Sheets . . . confident each order for a particular end use will be UNIFORM in quality from shipment to shipment. For Inland studies its customer's requirements—knows their operations and equipment—"tailor-makes" Inland Sheets to perform uniformly, time after time after time.



Fabrication of juke box fronts involves lancing and expanding to create intricate designs; make a low cost, attractive, finished product.

World globes can be lithographed flat, *then* drawn. Areas, distorted when flat, become proportional—even if embossed in relief.

Fast, efficient production of spun light reflectors is possible, despite their severity, with uniform Inland Cold Rolled Sheets.

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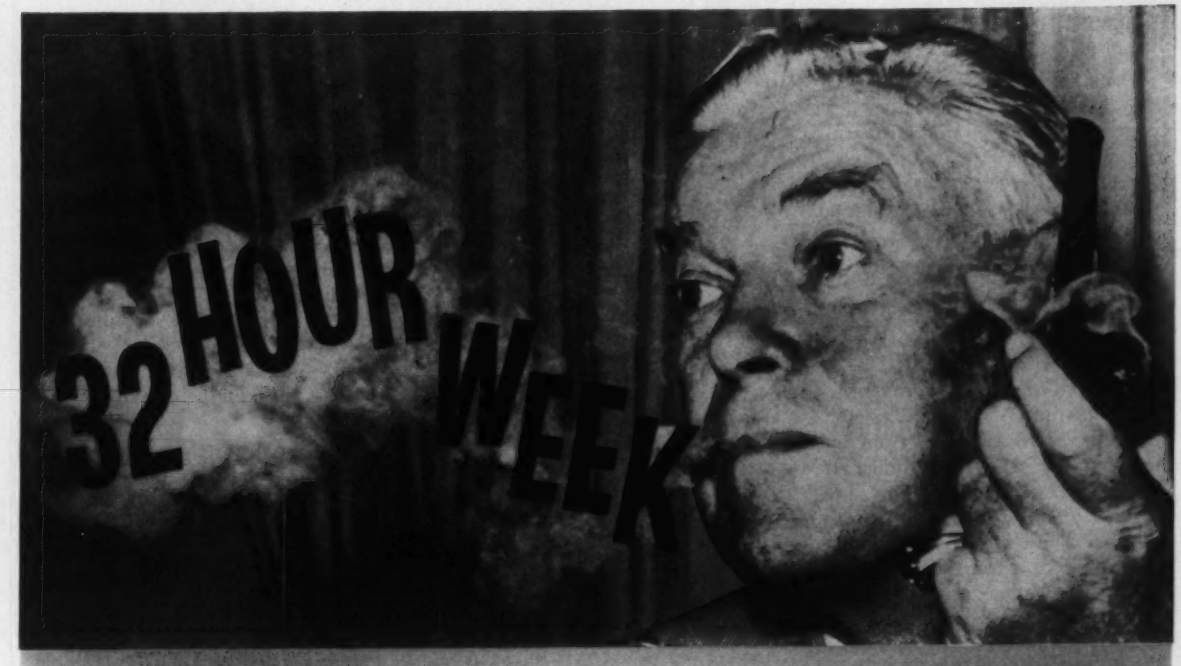


McDonald's Pipe Dream?

YOU CAN EXPECT the union furor for the 32 hour week to get noisier.

Despite all the political oratory at the United Steelworkers of America convention in Atlantic City last week, the short workweek issue emerged as the top demand on the union's "must" list.

The USW won't try to open its contracts with the steelmakers on the issue before 1962, but it will stump for Congressional action next year. It'll use the Human Relations Research Committees as sounding boards. (The labor-management groups were set up in last January's steel settlement.)

When steel contract talks get underway in 1962, the short workweek is bound to be a major battle cry. It'll get its first test when the United Auto Workers talk contract with automakers next year.

● **Why the Push?**—Labor's emphasis on the 32 hour week stems from sharp unemployment. Says the USW: "Of our people, 135,000 are totally unemployed and 350,000 others are working less than full time." The union claims membership of 1,250,000 in the U. S. and Canada.

In the first two months of 1960 when the steel industry was producing at an annual rate of 139 million ingot tons, it employed 534,000 production and maintenance people. In the good production months of May and June, 1959, 544,000 were on the rolls. Average employment was nearly 572,000 in 1955 when 117 million tons of steel were produced. Employment was nearly 572,000 in 1953 when 112 million tons were turned out.

● **Breakeven Point**—The USW claims: "The average breakeven point for steel is now well below 40 per cent of capacity and, for some companies, below 30 per cent." It bases that contention on the showing of the 28 major steel companies in the second half of 1959. "They just about broke even despite extraordinary expenses in connection with the strike and despite the average operating rate for the second half of just under 40 per cent."

The union also showed resiliency despite the strike. Its net worth as of June 30, 1960, was $27.3 million, up $861,000 from Dec. 31, 1959. Net worth two years ago was $33.6 million.

President David McDonald's opening address was surprisingly mild and almost nonpolitical in comparison with other principal talks. U. S. Sen. John F. Kennedy, Democratic Presidential hopeful, said his plans for a stronger economy would add to labor's bargaining power.

In a press conference, however, he stated that he wasn't too keen on a 32 hour workweek and that he preferred a strong economy with

everybody working 40 hours.

The Steelworkers passed a resolution supporting Kennedy for President.

• **White Collar Push**—USW President McDonald also called for stepped up drives to organize salaried whitecollar employees. "If we do not organize clerical and technical employees, we will become a minority force in our own industry," he lamented. Salaried employment in the industry has climbed from 111,000 in 1953 to nearly 125,000.

In other proposals, the UAW urged establishment of a commission of continuing prosperity, composed of representatives from industry, labor, and the public. Its functions: Study and propose programs to maintain continuing prosperity and full employment.

The USW is considering establishing its own medical centers unless the effectiveness of present programs is improved. Mr. McDonald said that Blue Cross-Blue Shield and the commercial carriers are failing to control costs. He feels employers should invest part of the steel industry's pension funds in medical facilities.

• **1961 Program**—In addition to the 32 hour week, the USW will also support this legislative program in 1961:

1. Lower income taxes for lower income groups.
2. Reduction or elimination of most excise taxes.
3. Expansion and extension of unemployment compensation and other social security benefits, including medical care for the aged.
4. Adoption and expansion of programs for public works, school construction, and housing.
5. Higher minimum wage of $1.25 and expansion of its coverage.
6. Aid for distressed areas.

• **Rebel Fire**—The greatest fire from Mr. McDonald came when he announced that he wasn't "going to stand for any nonsense from delegates." He was referring to the Rarick rebels who gave him and other international stalwarts an unexpectedly close race for international offices in 1957.

At one point, Anthony Tomko, a McKeesport, Pa., local representative, was beaten up while trying to distribute anti-McDonald literature.

After McDonald and company were re-elected, the international made an unsuccessful bid to oust Donald C. Rarick and several of his supporters. Many of them were re-elected to office in their locals and were delegates to the convention. Rarick is president (and delegate) of Local 2227.

It was clear that the rebels still have minority strength, but they won't hamper Mr. McDonald's chances when elections are held in February, 1961.

Steel-Rail Pacts Signed; GE-IUE Near Deadline

NOW that U. S. Steel Corp. and the railroad unions have agreed on a contract, attention is being focused on negotiations at General Electric Co. and Westinghouse Electric Corp.

Negotiations between the International Union of Electrical Workers and the big electrical manufacturing firms resumed Sept. 20, following the IUE's constitutional convention in Miami Beach, Fla.

At the IUE sessions, the union endorsed a "no contract, no work" resolution. It also set up the machinery for all locals to conduct an "informational vote" Sept. 25 (Sunday). Objective of these polls is to sound out the membership on the offers made by the companies as a guide for the bargaining teams.

GE promptly responded that Sunday was the worst possible day to get members down to union halls to vote. It offered to provide plant facilities for a secret ballot on a working day at company expense. When STEEL went to press, only the Schenectady local had accepted the offer and voting was to be held on Sept. 22 and 23.

GE negotiations will continue until 10 a.m. Sept. 30, say union officials. At that time a meeting of the IUE-GE conference board (representing all locals) will meet to accept or reject the GE proposal.

Last week, GE was close to a contract with the International Association of Machinists and the United Auto Workers at the firm's Evendale, Ohio, plant. The company offered pacts similar to those presented the IUE—a 3 per cent wage increase on Oct. 2 and a 4 per cent increase 18 months later, plus insurance and pension improvements.

U. S. Steel began stepping up operations last week following settlement with the Brotherhood of Railroad Trainmen. Agreements between the Trainmen and the U. S. Steel rail subsidiaries all run to Nov. 1, 1962. The pacts represent a blend of wage increases won in the national rail settlements and fringe benefits patterned after the basic steel contract signed last January.

New contracts call for a 5.4 cent an hour wage boost on Mar. 1, 1961, plus an additional 5.4 cents on Nov. 1, 1961. The existing 17-cent cost-of-living adjustment was written into the base pay. The union says the settlement contains a modified cost-of-living provision similar to that in the steel contract, plus other fringe benefits. The total package was estimated to be about 40 cents per hour.

• **Midwest Settlements** — Two strikes were also settled in the Midwest—one at J. I. Case Co., Racine, Wis., and the other at American Manganese Steel Div., American Brake Shoe Co., Chicago Heights, Ill.

The United Auto Workers had been on strike at Case for six months. Wage hikes (which were not a major issue) of 4 to 18 cents per hour were granted. The contract also included changes in seniority, promotion, and transfer provisions; increased insurance benefits; and triple pay for holiday work.

The American Manganese strike started Jan. 5. The new pact calls for a three-year contract with wage increases taking effect Sept. 18, 1961, and Sept. 18, 1962. Its expiration date is Sept. 1, 1963.

Economist Sees Upturn in Mid-'61

LOOK FOR government spending to spark an upturn in the economy, starting in mid-1961, says Russell H. Metzner, vice president and economist for Cleveland's Central National Bank. He made the prediction last week at the annual forecast meeting of the Cleveland chapter of the American Marketing Association.

The economist thinks gross national product will reach a $522 billion annual rate in the fourth quarter next year—see chart.

The economy is now in a modest, fairly short correction which won't be as long or as deep as that of the 1957-'58 recession, says Mr. Metzner.

He sees a seasonal uptrend developing for the current quarter, but it won't be as much as folks want.

• **Election Help** — The Cleveland economist feels that the next President (Nixon or Kennedy) will find quick methods of putting more money into the economy, but the effects won't take hold until midyear.

The durable goods segment is hit the hardest. Mr. Metzner feels that the Federal Reserve Board's industrial production index (largely reflecting durables) will trail the rise in GNP. Starting from a predicted level of 108 (1957=100), this is how he predicts the FRB index will shape up next year:

1st quarter	104
2nd quarter	96
3rd quarter	102
4th quarter	109
1961 average	103

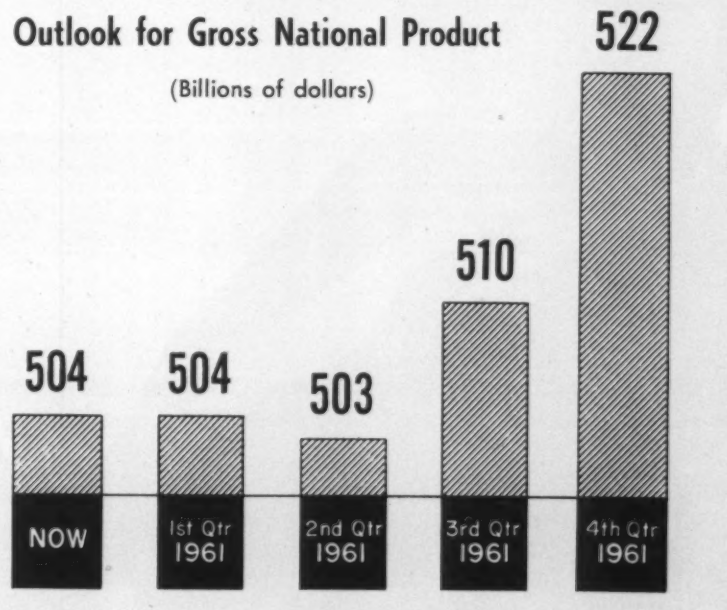
This year, the FRB index will average 109, and gross national product will set a record at $505 billion.

• **Gains Canceled** — Between now and the second quarter of 1961, the total economy will show little change. Mr. Metzner sees government spending advancing from an annual rate of $102 billion to $106 billion. Construction, at an annual rate of $38 billion in the third quarter, will remain steady for six months, then advance to a $39 billion rate in the second quarter next year. The gain will be offset by a drop in durable equipment expenditures—from a $30 billion rate to $27 billion. Gains in personal spending for nondurables and services will be partially erased by a decline in durables spending.

• **Appliances**—R. T. Killian, manager, marketing planning, Westinghouse Electric Corp., Mansfield, Ohio, sees a recovery for the appliance industry next year, but it won't be spectacular. So far in 1960, factory sales are down about 7 per cent ("headed for 10 per cent"), and they will continue to be soft during early 1961. But as housing makes a comeback early in the year, appliances will be influenced upward by midyear.

• **Autos**—Thaddeus J. Obal, senior economist for Ford Motor Co., anticipates fourth quarter auto production of 1.8 million to 2 million units, pushing the yearly figure close to 6.8 million units. The inventory of new cars will be at a record 1.1 million at the beginning of 1961. While the official sales forecast for 1961 is about 6.5 million autos, Mr. Obal feels that it could go down to 6 million (see Page 79).

• **Aluminum**—George Van Buren Day, assistant manager, Commercial Research Div., Aluminum Co. of America, sees a pickup in shipments of aluminum in the fourth quarter. The industry will go on to regain this year's losses in 1961 and could come close to matching the all-time high reached in 1959. Use per car in 1961 will hit about 60 lb, 10 per cent over the 1960 model figure. Use per new house now totals 200 lb compared with only 100 lb five years ago. An upturn in housing starts will push consumption up significantly.



How to Bid Smarter on Government Contracts

"Most firms bidding on defense contracts know the mechanics of bidding, what contracts are available, and what's required if they win," says Harry B. Rottiers, director of defense contracts, Burroughs Corp., Detroit. "But too many fail to check all the implications—and then wind up with profitless contracts." These eight points may help you bid smarter

1. Is it in your area of interest?

Most firms are better off bidding for jobs which are closely allied to their commercial operations. They'll be more skilled, may be able to develop techniques or information that will benefit nondefense activities. "We're concerned with computation, data processing, and communications systems. We don't bid on contracts to design or build tanks or airframes," says Mr. Rottiers.

2. What type contract is it?

A fixed price contract may be too risky for R&D. Fixed price plus incentive may be better than a redeterminable contract for production work. Cost plus contracts usually imply less direct profit but may result in additional contracts or less tangible profits in the form of technical or production knowhow.

"Government technical advisers and inspectors can teach you a lot if you're willing to learn"

"It's generally more difficult to compete in a program that's fairly well advanced than one still in the early study phase"

"You may find yourself in the position of being customer, vender, teammate, and competitor to another firm"

The government's technical advisers and inspectors can teach you a lot if you're willing to learn.

3. What's the program's status?

Is the project in an early study phase or has equipment already been designed—perhaps by a competitor? Have some units been produced? Generally speaking, the further advanced the program, the more difficult it will be to compete successfully.

4. Should you pick only one proposal?

Often you're faced with simultaneous bids on several projects. Should you "go for broke" on one, or try to cover them all? What demands will be made on facilities and personnel to prepare any or all of these bids? How soon will another bid request be coming along which may be more worthy of your full attention? Is there a future production potential? In figuring, don't overlook the possibility of contract developments in NATO countries, Canada, Latin America, or Japan. Mr. Rottiers thinks it's usually better to concentrate on the most desirable proposal and let the rest go.

5. Will you have to expand?

Are your present facilities and manpower adequate? Will you have to spend working capital to renovate or reopen facilities? What might you have to tie up to meet standby or mobilization needs? How long will you have to pull trained personnel away from other important jobs?

6. Who's your competition?

Prior bids, Department of Defense briefings, symposiums, trade literature, and association meetings can help you spot and evaluate potential competitors. Do they have prior experience in this area? What production, technical, and manpower skills, and facilities do they have in the contract area?

7. How do you select the team?

This is most vital aspect of weapons concept systems. Your company should evaluate potential team members in terms of their accomplishments, competitive position, and reputation. You may find your firm in the position of being customer, vender, teammate, and competitor to another firm. Should you go prime or aim at an associate or subcontract agreement? Maybe you should consider all three. How do your company personnel (from top management on down) get along with the potential teammates? How much information would you have to share with a firm that's a close competitor in your commercial business? Be sure to survey your subcontractor network to see how the companies fit into team bids.

8. What are contract price and terms?

It can take months and more than $250,000 to merely prepare a contract. How long will key manpower and facilities be tied up to formulate the bid? How much initial research is needed before you bid? How do you plan to recover the costs?

Have you checked on clauses covering patent and data rights? How about payment withholding clauses? Should you press for a redetermination clause on fixed price contracts? Can you get indemnity coverage if it's needed?

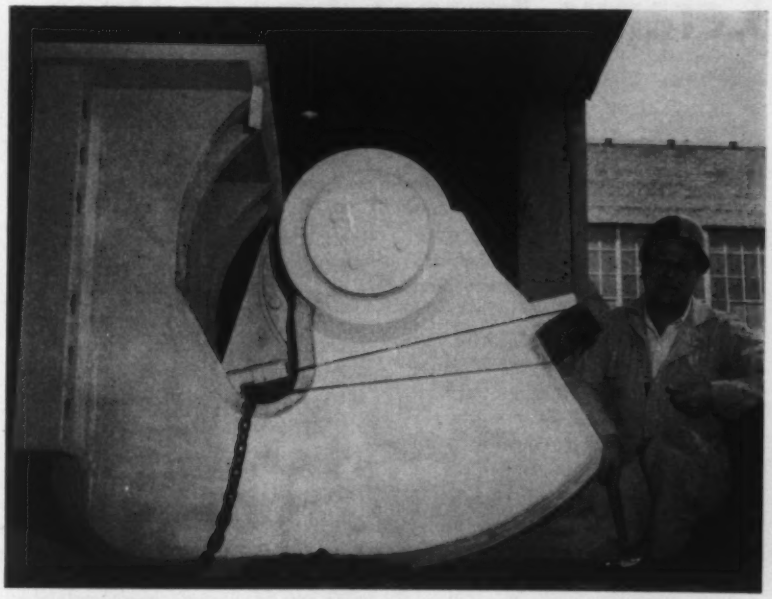
1st Half Exports Up

U. S. exports climbed sharply in the first half, reaching $9.7 billion, a total exceeded only in the first half of 1957, reports the Department of Commerce. These factors accounted for the increase:

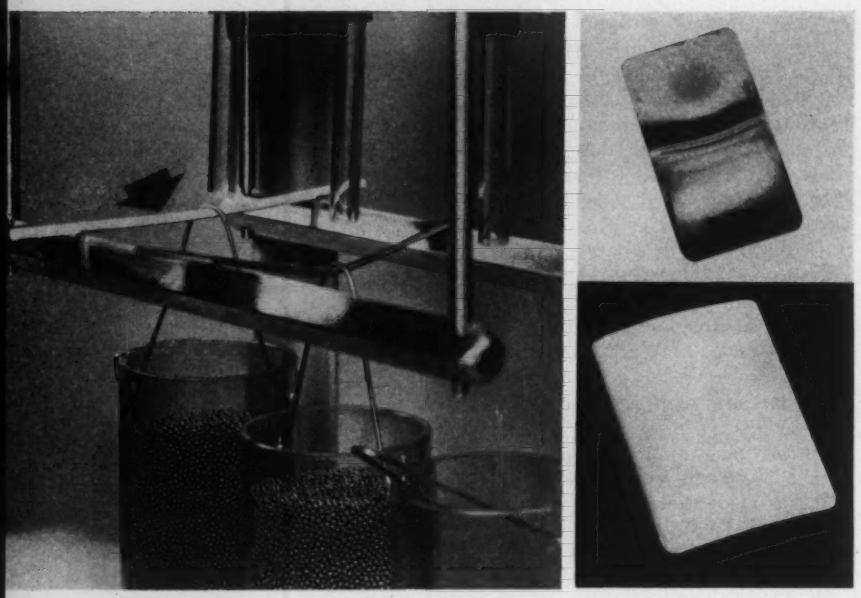
- Intensive industrial activity in Western Europe and Japan.
- The lifting of many import controls on dollar goods by Western European countries.
- Improved foreign exchange positions of some Asian and African countries trading in primary products.
- Sales of surplus agricultural commodities in African countries.

U. S. sales to Western Europe were up 50 per cent over those of January-June a year ago, and shipments to Japan jumped 48 per cent.

As exports advanced, U. S. purchases from abroad declined to $7.6 billion in the first half, slightly under the record level of the second half last year but well above the rate for any other semiannual period.



IT'S A HINGE! Nearly 5 ft high, this is one of a 600 ton set being made for the doors of underground silos from which the U. S. Air Force ICBM will blast off into space. They're being welded, flame cut, and machined at Lukens Steel Co., Coatesville, Pa., for American Machine & Foundry Co., contractor for the launching systems. The heavy gage steel was fabricated to tolerances "as delicate as those on the hinges of a jewel case," says Lukens



Ceramic undergoes rigid tests: In a modulus of rupture test (left), the Nucerite rod (arrow) withstood 85,000 psi stress without failure or any permanent deformation as lead shot was gradually added to suspended vessel. A mild steel rod shows a ½ in. bend. It was permanently deformed. At right, a sample of molybdenum (top) and Nucerite were subjected to an oxyacetylene flame (1600° F) for 5 minutes. The molybdenum sample was severely oxidized, the Nucerite unaffected

Ceramic Enters Space Race

A NEW MATERIAL for ceramic-metal composites combines structural strength with high resistance to impact and hot corrosive environments. Potential applications: Chemical, nuclear, and space technology.

The ceramic, called Nucerite, was introduced last week by Pfaudler Co., a division of Pfaudler Permutit Inc., Rochester, N. Y., manufacturer of glassed steel equipment for industry.

Nucerite is chemically bonded to steel and to heat resistant metals such as Inconel and Hastelloy in the same manner as glasses.

• **Anticipated Applications** — It is probable, the company reports, that certain reactive metals, such as tantalum, columbium, and molybdenum, which maintain strength at high temperatures, will also serve as base metals.

E. A. Sanford, Pfaudler vice president-director of research, says:

"We do not expect that Nucerite will replace any of our current corrosion resistant materials; but, rather, it will expand the scope of applications for which we can furnish the proper material of construction."

• **Resists Corrosive Attacks** — Pfaudler engineers report that in one formulation the new material has resisted attack by corrosive vapors at 1300° F—a temperature that would destroy most metals in a few seconds under similar conditions. (That temperature is expected to be exceeded by several hundred degrees.)

In aqueous environments, its resistance to corrosion is superior to most metals, the engineers say.

Other Pfaudler laboratory tests on Nucerite show:

Tensile Strength: It withstood more stress than mild steel without permanent deformation.

Impact Strength: It withstood 9 ft-lb of point impact force, or about 18 times that needed to shatter safety plate glass.

Thermal Shock: It displayed a 300 to 400 per cent increase in resistance to thermal shock over glassed metals.

Abrasion: It was 400 per cent more resistant to abrasion than laboratory glass.

Heat Transfer: It was 6 to 10 times better than other ceramic materials used in high temperature corrosive service.

High Temperature Stability: It protected molybdenum from oxidation at 1600° F in an oxyacetylene flame.

During a three year development period, Pfaudler coated and tested such items as small reaction vessels and heat exchanger tubing. The company points out that it will take much more work to get Nucerite ready for full scale production in its plants here and abroad. Patent applications have been filed.

U.S. Offers Free Course On National Security

The Industrial College of the Armed Forces is accepting business, industrial, and professional applicants for enrollment in a free correspondence course called "The Economics of National Security."

The one year course is organized into five units: Background Information, Resources and Facilities, Processes in the Economics of National Security, Foreign Aspects of National Security, Problems of National Security.

Conducted under the direction of the Joint Chiefs of Staff, the course is similar to that given to senior military officers and civilian executives of the federal government.

Qualified persons (a college education or its equivalent is desirable) may apply to the Commandant, Industrial College of the Armed Forces, Washington 25, D. C.

Strapping: 5% Upturn Now, 5% in '61

MAKERS of steel strapping and application equipment predict this year's sales will top 1959's by 5 per cent.

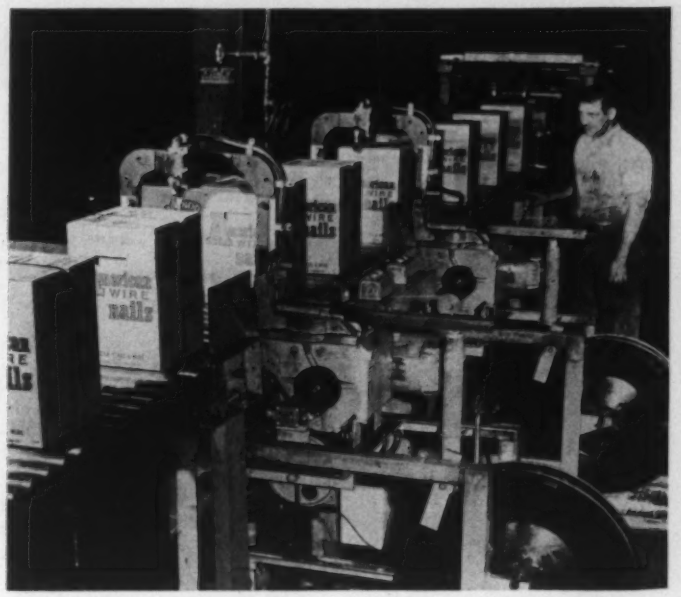
They're projecting an additional 5 per cent gain for 1961.

Reasons: New developments in materials and equipment, plus hopes for increased steel ingot production and railroad carloadings next year.

There are two basic developments in materials:

1. More strength is going into each pound of strapping through chemical changes and new steel processing methods. The improvements permit use of lighter sizes, reducing cost per foot.

2. Better, and in some cases less expensive, coatings are being applied to strapping. The new coatings are more easily applied and improve resistance to corrosion. Smooth, lubricated surfaces increase resiliency.



• Producers say that the developments are securing primary markets and opening new ones for them.

Joseph Myers, vice president-marketing, Acme Steel Co., Chicago, is optimistic about a rise in steel ingot production and railroad carloadings. He says: "Historically, strapping sales have been related to steel ingot production and railroad carloadings. Forecasters generally are predicting increases in both categories for 1961."

• New application tools are designed to save space and time.

Manufacturers are offering more powered portable tools, more automatic equipment, and more custom built machines. Use of pneumatic, electric, and hydraulic tools is steadily increasing as plants demand faster, labor-saving equipment.

More and more machinery will be custom built, says Keith P. Rindfleisch, vice president-commercial, U. S. Steel Supply Div., U. S. Steel Corp. "Certain components may be standardized," he says, "but the way they are put together will vary with end use. These machines will be more expensive than those in use today, but will effect overall reductions in packaging costs as a result of their speed and labor saving features."

There is increased use of tools and dispensers to apply strapping directly from the coil, reports S. E. Heymann, manager-advertising and marketing research, Signode Steel Strapping Co., Chicago. They eliminate waste that occurs when precut lengths are used.

• Use of steel strapping for bundling heavy products is on the rise.

New markets for steel strapping include: Hot steel coils, bricks, lumber, ceramic tile, multiwall bags, and construction of concrete columns.

• Foreign competition and competitive materials may cause some sales headaches.

Nonmetal strapping and tape usage are growing, says D. F. Downing, executive vice president, A. J. Gerrard & Co., Des Plaines, Ill. (His firm also makes some of the nonmetal types.) Frank Knecht Jr., vice president-general manager, Brainard Div., Sharon Steel Corp., Sharon, Pa., reports that pressure sensitive tapes are replacing steel strapping as a form of closure in some lightweight corrugated containers where around-the-box reinforcement isn't needed.

Steel strapping has lost out on some rail carloading applications to rubber dunnage and compartment-type boxcars.

"Imports of steel strapping, like other forms of steel, reached a peak early in 1960," relates Signode's officials. But imports are declining, possibly because the boom in steel in Europe is decreasing the availability of steel for export. Our exports of strapping have also been declining—due largely to our high production costs.

While foreign competition hasn't cut too deeply into domestic markets, U. S. firms are stepping up efforts to improve material quality, speed up strapping equipment, and upgrade technical service to users. They're hoping plant managers won't give up the broad product lines, personal service, and technical assistance for the few dollars in savings offered by foreign suppliers.

SBA Renews Fight for Role in Subcontracting . . . Right-To-Work Law Faces Hassle . . . More Business Help Overseas

Here's Why SBA Wants More Say in Defense Contract Awards

- Make or buy decisions of prime contractors aren't always in the best interest of government.
- Small firms don't always get their share of subcontracts.

Defense Department must find a way to inform prime contractors about qualified small firms. Prime contractors should justify not using small firms as subcontractors.

PRESSURES are building up to force large defense contractors to give a bigger slice of the defense pie to small businesses. In the last session, the Senate approved a measure to insure the Small Business Administration a more important role in determining where subcontracts went. The effort was stalled in the House, but in January you can expect the new Congress to get the bill again. Next time it could pass both houses.

The Senate Small Business Committee is feeding the fire, charging prime contractors with waste and inefficiency in the administration of some of the larger "weapon system" contracts. (Under Air Force procurement, one firm is given the responsibility for a complete system, such as an aircraft or missile.)

The committee has released a report on General Dynamics Corp.'s Convair Div. with the provocative title: "The Hidden Costs of the Weapon System: A Case Study in Waste."

The committee reports that the General Accounting Office figures the U. S. lost $2.7 million by allowing Convair to handle a contract for B-58 air-conditioning carts. Present equipment could have been adapted to the job, says the Senate committee. Convair, the weapon system manager, subcontracted the job to its own San Diego plant with Air Force approval. After a year, the Air Force decided to adapt standard ground support equipment for the B-58 job.

● RIGHT-TO-WORK LAW FIGHT? — Democrats angling for labor's support in the November election are telling union leaders that the next Congress could kill the right-to-work law authorization in the Taft-Hartley Act. Sen. Hubert H. Humphrey (D., Minn.) will lead the fight in January on Capitol Hill.

Here is the sort of arguments that will be used:

1. Right-to-work laws are opposed "by a great proportion" of business leaders.
2. They have been "denounced" by church leaders.
3. Union members are "97.1 per cent" against such laws.
4. Wages paid in right-to-work states are lower than they are in other states.

● MORE FOREIGN TRADE HELP—The State Department reports its overseas posts are sending more studies on foreign trade opportunities back to the U. S. than ever before. With increased commercial staffs overseas, the agency also promises more personal attention will be paid to the businessman who ventures abroad. Within three years, the department hopes to double the number of commercial officers overseas. Presently, 112 are on the job. Fifty-three will be added in this fiscal year. Twelve will be assigned to cities which have no commercial officers now.

● IS MINUTEMAN PROTECTION ENOUGH?—Encouragement to missile contractors comes from Lt. Gen. B. A. Schriever, Air Research & Development Command boss, in this statement: "The Minuteman missile is an economic breakthrough . . . the unit savings can be translated into more deterrence for our money." The general notes that the relatively small intercontinental ballistic missile is like the compact car to automobile makers: It is likely to have a stimulating effect on business even though each unit consumes less fuel and has a smaller margin of profit.

Calling the bird the first truly mass produced ICBM, the general argues that large scale production of it is our best deterrent to war. Because there are no firm plans for another ICBM after Minuteman, the lucky firms with contracts for it may look forward to long production runs, the general believes. But some defense industry analysts take another view. By pruning our missile programs to a few absolutely necessary birds, they say, we may be cutting back our potential to develop new ideas in missilery.

● MERCHANT MARINE RESEARCH URGED—A technologically superior U. S. Merchant Marine is one way to tackle world trade problems, says the National Academy of Sciences-National Research Council. A special committee of 55 scientists and engineers has told the academy that $10 million to $12 million a year is needed for nonnuclear research over the next ten years.

72 Years of Engineering Experience behind MORGAN ROLLING MILLS

Since 1888 the Morgan Construction Company has used engineering with ingenuity—employed top flight creative skills—to make many significant contributions in the field of rolling mill equipment. For example, Morgan has developed and produced:

Continuous Billet and Sheet Bar Mills—Continuous Skelp Mills—Continuous Mill Twist Guides—Automatic Rod Reels—Continuous Billet Heating Furnaces—Hydraulic Flying Shears—Steam Flying Shears—Up and Down Cut Flying Shears—DuoFinishing Mills—Escapement Type Cooling Beds—Universal Type Cooling Beds—Carryover Type Cooling Beds—Automatic Pack Annealing on Cooling Beds—Four Strand Rod Mills—Double Strand Merchant Mills—Skew Y Reversing Tables—Edging Mills—Vertical Mills—MORGOIL Bearings—Automatic Billet and Slab Separating Skids—Electric Crop and Cobble Shears.

. . . and many more contributions to come from the skilled, imaginative engineers of Morgan Construction Company.

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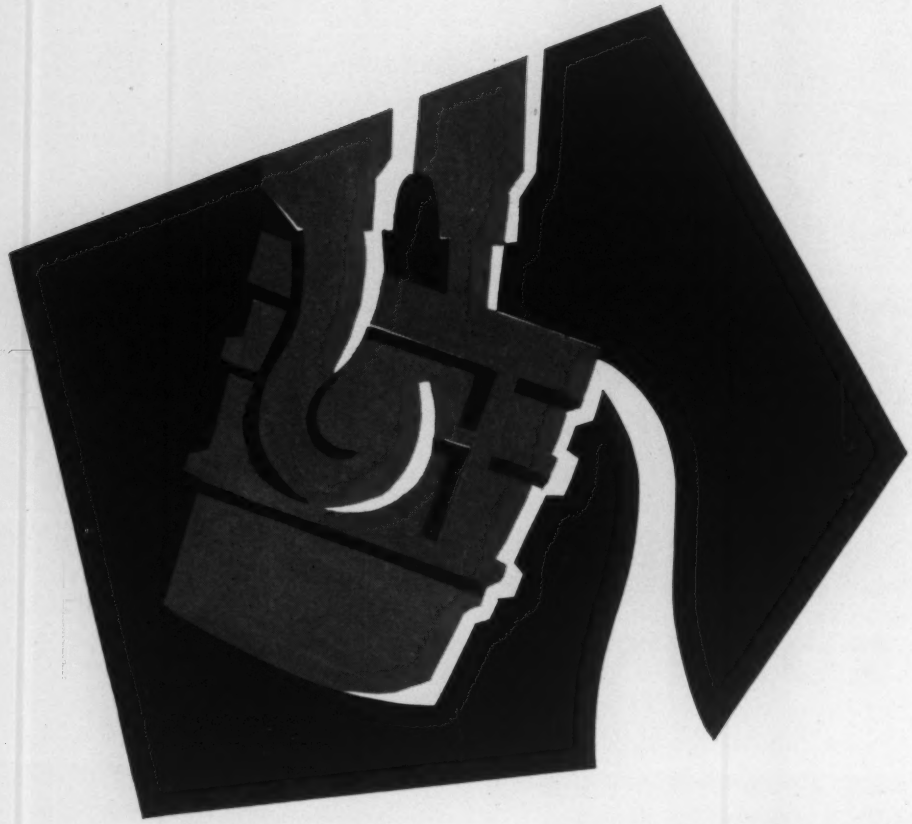
RM-81



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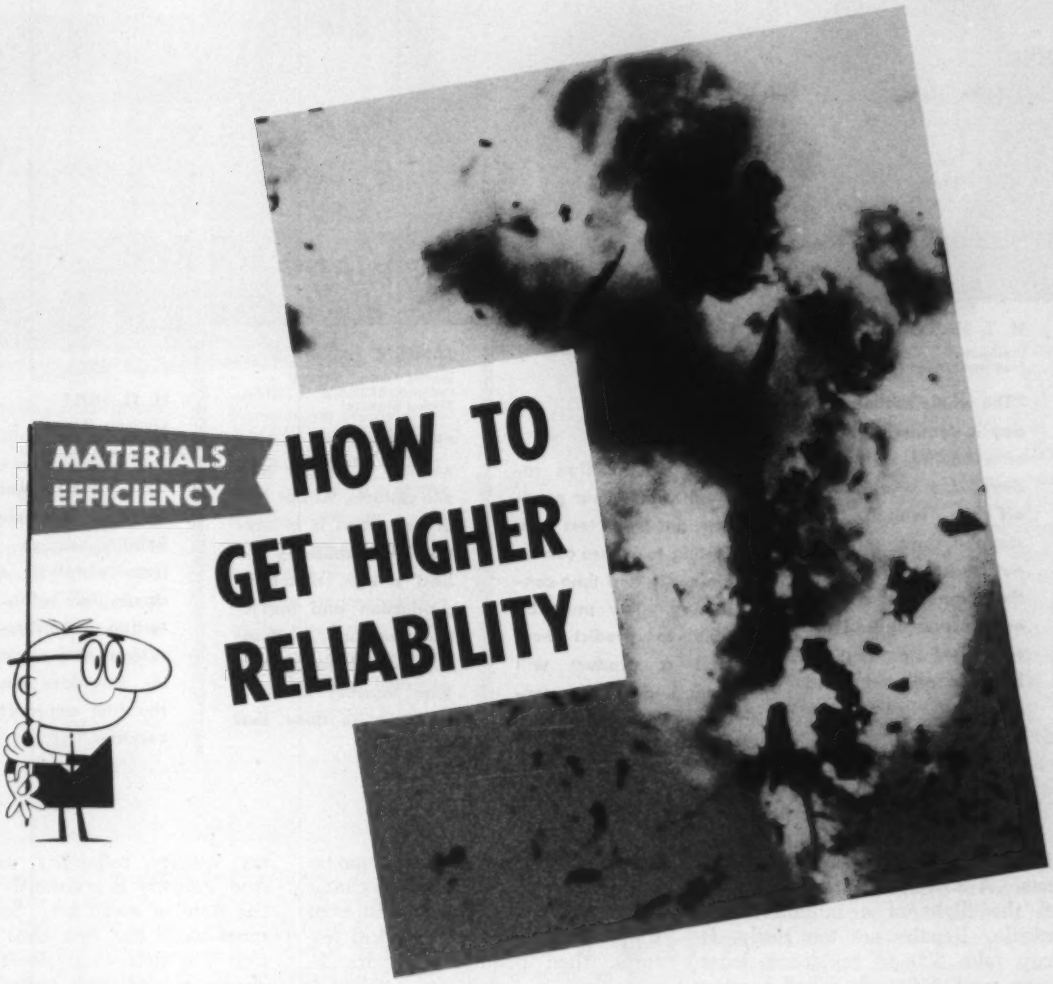
NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION



HOW TO GET HIGHER RELIABILITY

TO PUT AN ATLAS missile on target 9 times out of 10, each of the missile's 300,000 components must have a reliability of 99.99996 per cent.

That points up the fantastic demands being placed on metalworking by the Space Age—and not just on the missilemaker. All customers want products that will perform better longer. And they want that quality at no—or little—extra cost. Result: Emphasis on reliability promises to become one of this decade's most significant trends.

What is Reliability?

Reliability is the probability that a device will function without failure under given conditions for a given time. ("Failure" means any variation beyond allowable limits, not necessarily total failure—which reliability people call "catastrophic failure.") Reliability can be measured and stated mathematically. It's both a qualitative and a quantitative concept. It's taking a place alongside efficiency, speed, accuracy, and other industrial performance factors.

What It Means

The emphasis on reliability promises tremendous benefits to the customer. Imagine an automobile that would run well for 200,000 miles. Or an automatic washing machine that wouldn't need service for ten years. Or eyeglasses whose little screws never pop out.

High reliability will put a man into orbit, raise our standard of living, and give metalworking a bigger share of the consumer's dollar. Through reliability, producers of durable goods can trim billions off the consumers' $16 billion annual repair bill. The maintenance money saved can be used as a down payment on a boat, or to buy new golf clubs, or to get mother that automatic kitchen doodad.

Why It's Needed Now

In today's costly and complex civilization, it is increasingly essen-

H. T. HALLOWELL JR.
President
Standard Pressed Steel Co.

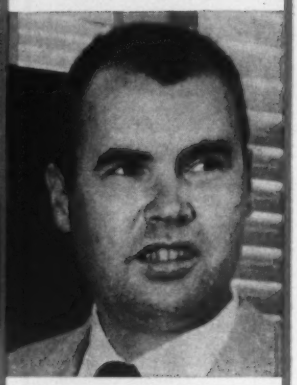
"The whole economy today is demanding higher reliability. In the old days, if a wheel came off the wagon, you stopped and put the nut back on. Today on the turnpike, if a loosened screw caused the sun visor to drop, a head-on collision could result."

ELDEN H. OLSON
Engineering Director
Aeronautical Div.,
Minneapolis-Honeywell

"You must design reliability into your products, not try to test it in. Testing to failure can be too costly and time consuming. You must be able to predict how well a product will work under given conditions for a given period of time."

JAMES E. FAIRCHILD
Quality Control Manager
Hunter-Bristol Div.,
Thiokol Chemical

"For the reliability needed in today's missile systems, 90 per cent of the effort is in controls — establishing the best design, materials, production and inspection procedures, packaging and shipping, and then insuring that the job will be done that way."



N. H. HOLT
Reliability Manager
Aeronautical Div.,
Minneapolis-Honeywell

"There are six main approaches to solving reliability design problems—simplicity, redundancy, fail safety, protection, derating the system, and serviceability. Simplicity should be the first approach you consider."

tial to produce dependable products. A 25 cent resistor has aborted the flight of a million dollar missile. Repairs are too costly. It may take $20 to replace a loose screw, or $1000 to fix a bad bearing on a machine in the middle of an automated line.

Increasing competition forces higher reliability. If steel doesn't do the job, the customer may turn to aluminum. If a casting cracks, the manufacturer may switch to a weldment. If the weldment doesn't hold, he may buy a forging.

You get safety through reliability. Standard Pressed Steel Co. reports that the cars on the highway today have 5 billion critical mechanical joints—all potential killers.

Reliability begets productivity. With automation, failure of machine parts is intolerable. "To the expense of downtime, add the thousands of dollars of precious tooling that can be destroyed by just one loose shoulder screw in the jaws of a hydraulic press," suggests J. V. Lester, SPS's vice president.

Reliability replaces maintenance. Time was when one good mechanic could repair any machine in your shop. But we added electrical features, then pneumatic, hydraulic, and electronic elements. "Now it takes as many as five experts to fix something, and a sixth to tell which experts to call in the first place," declares Mr. Lester.

Miniaturization demands reliability. The urge to do more with less means that the smaller you make something, the better the materials you use must be. Today's electronic wizards who cram millions of parts into 1 cu ft of space leave little room for unknowns.

It's Tough to Get

But reliability is like a salary boost. It's tough to get; it must be earned; it takes time.

Elden Olson, director of engineering, Aeronautical Div., Minneapolis-Honeywell Regulator Co., puts it this way: "The manufacturer today is squeezed between delivery, quality, reliability, and price. And industry is constantly pressing the state of every art. Some parts must work the first time they go into the field—you don't have a chance to test them under environmental conditions. In other cases, testing to failure is far too costly. You must be able to predict reliability.

"And you must get it economically. It may cost more in the initial purchase price. But buyers must learn to think in terms of the total cost. Management must learn to track down the end cost of an apparent saving—to be sure that an initial saving won't be paid for doubly in maintenance, downtime, replacement, or failure."

Design Establishes It

"You must design reliability into your products, not try to test it in," declares Mr. Olson.

How do you design for reliability? Norm Holt, Honeywell's reliability manager, answers with seven basic steps:

Mrs. DORIS L. GEIL
Purchasing Agent
Broderick & Bascom Rope Co.

"Purchasing must insure the reliability of purchased parts and materials—not just that the item is reliable, but that the supplier himself is reliable, that he'll give delivery as promised, any necessary service, and will meet the specifications."

JAMES L. HARRIS
Quality Control Manager
Standard Pressed Steel Co.

"High reliability is primarily people. It's in the machine operator's skill and common sense, in the supervisor's guidance, in the imagination of the researcher, in the consistent, conscientious effort of every member of the company."

1. Determine—from experience—how to prorate reliability. It means using prediction techniques.

2. Set reliability requirements for each element of the product.

3. Now design. *Simplicity* is the first and most important approach. The fewer the parts, the greater the odds against failure. *Derating* is also important. Reliability is improved by increasing the safety margin on parts. A third method is *fail safety*—designing a part in such a way that its failure will not cause catastrophic results. *Redundancy*—standby or parallel units—is another alternative. If one unit is 90 per cent reliable, two will be 99 per cent. But that adds cost, weight, and volume, so must be used with discretion. A fourth alternative is *protection*—insulating the unit from the environmental stresses that produce failures during its service life. Last but not least is *serviceability*. Proper maintenance is essential in obtaining good field reliability.

4. The hardware design stage. First, you make the parts as reliable as possible. If the parts don't fail, the system probably won't. (But it still can because the parts may not work together as they should.) You need a corps of experienced and imaginative specialists in the application of parts. They tell the design engineer which material or component is best for an application. Honeywell has 25 such specialists—one or two in each part family. The designer must know and specify the exact environmental conditions the part will be used in; then the specialist can base his decision on that information.

5. Review the design periodically. The reliability engineer—one in each product design team at Honeywell—looks at the design solely from a reliability standpoint.

6. At the prototype level, emphasis is on testing the device to determine performance over a long period. It might be exposed to accelerated stress tests above and beyond the ultimate environment—to catch something that would show up only after long service.

7. Feedback. Reports on field performance are fed all the way back to top management.

You should always learn the customer's requirements, not just settle for his design specifications, notes James E. Fairchild, quality control manager, Hunter-Bristol Div., Thiokol Chemical Corp. "Remember that the customer can misspecify," he warns.

Testing Verifies It

"Testing and inspection are the cornerstones of predictability," declares James L. Harris, SPS's quality control manager. "To do it effectively, you must emphasize the characteristics of the product as much as the item itself. The approach is not only to inspect the product, but to examine the consistency of diameter, or the thread, or the finish, or the length. Our approach is to have one person handle each phase and keep records on the consistency of the characteristics that contribute to quality."

To find out why you're having rejects, you must know what the defect is and what caused it. SPS has set up a quality auditing system to do that. Customer reaction, test findings, and measurements at the point of manufacture are coded on punched cards. A summary of inspection and manufacturing quality trends is fed back weekly, customer reaction monthly. The summaries show defects by type, by product group, and by production department.

Honeywell's quality manager, E. H. Dale, says the first step to quality is to make the examination meaningful. So well designed instrumentation and reporting forms are important. Honeywell automates test analysis and reporting wherever it can. Inspection data are fed into a computer (which can make 150,000 checks in 15 minutes).

At Thiokol, when an engineer asks for a test, he must spell out why it should be run. Reason: Statisticians in the reliability group can set up test methods that will return the maximum information.

Another tip from Thiokol: To get accurate and uniform test reporting, design the inspection process so that

it can be done only one way.

At Honeywell, a quality plan is initiated three to nine months before production. Quality engineers study engineering specifications, instrumentation, costs. They lay out a plan for testing and inspection, design any necessary testing equipment. Honeywell also sets quality goals. Then a monthly comparison of performance with the goals is given to top management. A policy manual defines who is responsible for what in the quality program. Honeywell's chief inspector, Michael Kaminsky Jr., reports that inspectors are placed in every area where any design, production, or prototype building is carried on.

Production Assures It

"High reliability results from the optimum design, the best material, thorough testing, well defined controls—and the best machinery and tooling for a job with well trained people operating it," says Mr. Harris.

SPS continually audits equipment performance. One technique: Three auditors on each shift use a roulette wheel to make a random selection of departments they'll visit that day. They check 10 per cent of the machines in the department, inspect 25 pieces at each machine and record their findings. A copy goes to the production supervisor. The findings are analyzed weekly; anything that seems out of line is investigated.

Honeywell's director of production, H. D. Elverum, points up the need to control such things as humidity, contamination, temperature —anything that affects the reliability of the product.

Even if the production machine is reliable, the operator can make it unreliable, Mr. Fairchild points out. So controls are necessary. One way: Design the process so it can be done in only one manner. Mr. Fairchild points out that numerical control is a big advantage. And he mentions a computer controlled setup where the computer accepts or rejects its own production. He says you should insist that manufacturing procedures be written so that quality control people can more easily control the processes—and so that workers follow the optimum—not the expedient—procedure.

Purchasing Supplies It

"Most top management people are beginning to recognize purchasing as a profitmaking department. The purchasing agent has many daily opportunities to trim costs and improve quality," says Mrs. Doris L. Geil, purchasing agent, Broderick & Bascom Rope Co., St. Louis.

Adds John P. Moorhouse, SPS's director of purchases: "The purchasing agent must not only seek out reliable suppliers but must try to help suppliers improve their reliability." One approach is a vender rating system.

SPS gives each vender a monthly rating—based on the ratio of rejected items to those accepted. The buyer (at SPS, each buyer has a specialty in which he is thoroughly schooled) goes over the rejection items with metallurgists or engineers, then will visit the supplier's plant to point out problems, perhaps suggest solutions.

Honeywell's vender quality rating system classifies vender performance against a set of standards. The rating tells the vender how good—or bad—he is with respect to acceptable quality levels. The vender gets a score: 75 means an average acceptable level. The vender gets a monthly and quarterly rating. If the quarterly rating is less than 60, the vender is reviewed by a committee of three men—from procurement, quality, and engineering. Sometimes the problem is given to engineering for a solution. Other times, Honeywell sends a quality engineer to the vender's plant to upgrade his inspection techniques. In other cases, the vender has been eliminated. Says J. L. Leppla, purchasing agent: "A system can be developed to rate one or more elements of the vender's performance—quality, service, delivery, price. The mathematics can be as complex or simple as you wish, depending on how much data you want. We are completely sold on the system and would recommend it, or one similar, to all who have a need for close control of quality."

The Key: People

"Reliability begins in the employment office," asserts Mr. Fairchild. "Good selection and placement procedures are an important step toward high reliability. Next, you must provide good working conditions."

"Attitude . . . training . . . control. Those are the key words in people reliability," says Honeywell's Mr. Elverum. "First, you build the employee's attitude to the point where he wants to do it right. Then you teach him the function of the item he makes; tell him what the product's user will experience. For example, why is a gyro important to a pilot? Then convince the employee that his quality will determine his future with the company. Then you teach him exactly how to do his job."

Honeywell's "personalized quality control" demonstrates the point. A roving inspector has little red discs in a box with employees' names on them. (The number of times a man's name is in the box depends upon the quality of his performance.) The inspector picks a disc at random, immediately goes to the work station of the employee and checks his production. A chart at each operator's station shows his quality performance—in a trend line. In one year, the program cut rejects by 60 per cent—and output jumped 10 per cent.

The Payoff

Reliability — the probability of success—is not a new concept. But the need for higher reliability has never been greater—and it will become even more imperative. Management must establish — now — a program to translate the ideal into reality.

Materials Efficiency

Standardize, Cut Costs

That's the article coming up Oct. 10 in STEEL's 1960 Management series. For a free copy of any or all articles in this 13 part program on materials efficiency (which started July 4 and is running every other week for the rest of the year), write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio. Also available on the same basis is the companion series on production efficiency which appeared during the first half. Use of materials like this may win you $1000. For details, see Pages 5 and 6.

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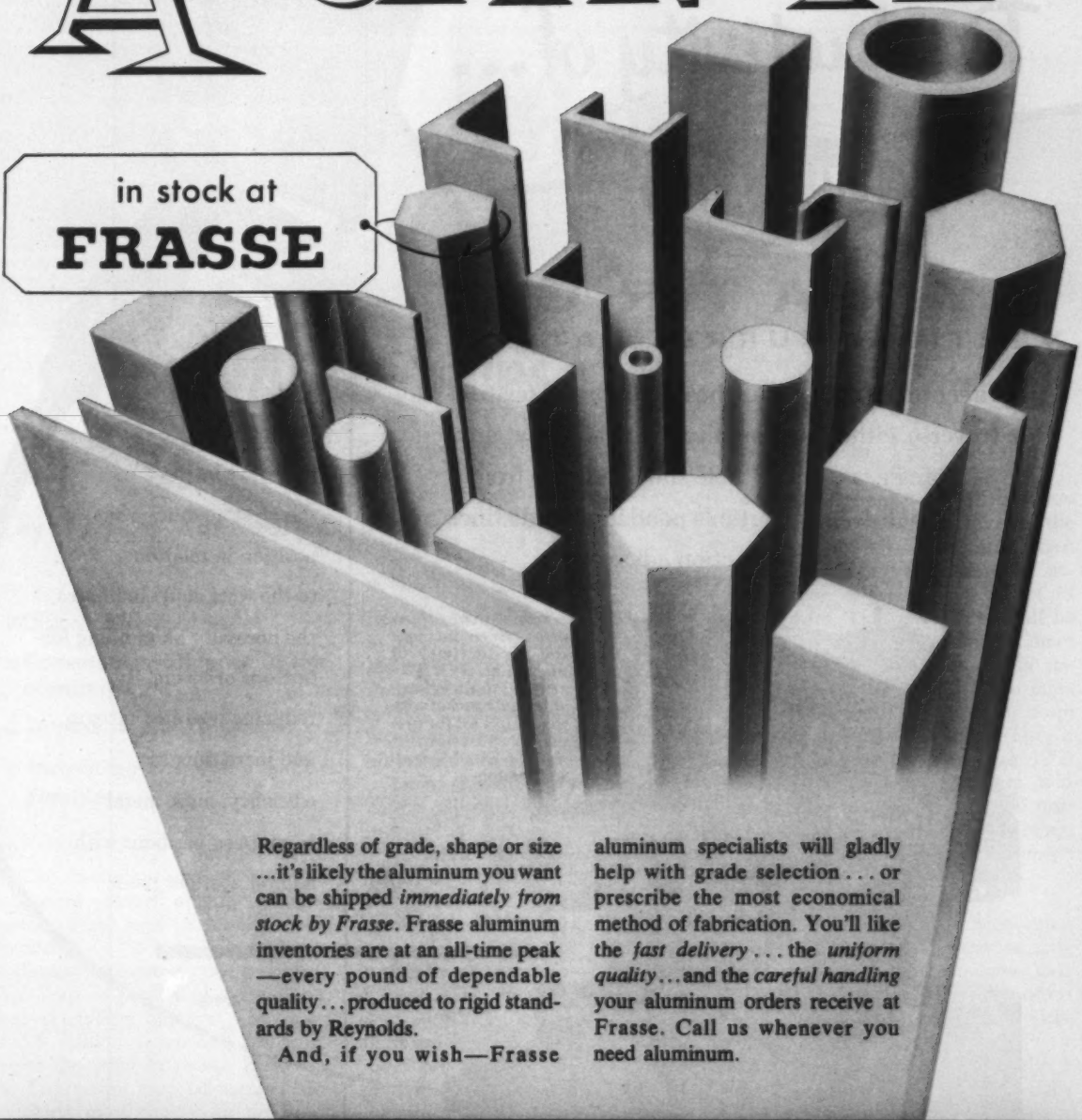

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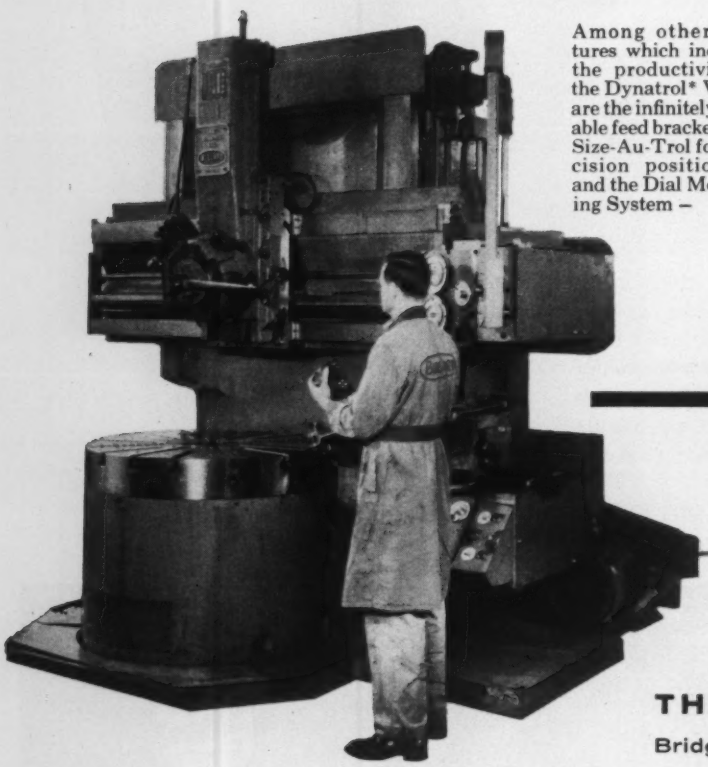

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YOU CAN'T BEAT A BULLARD

Outlook for 1961 Auto Sales

6 million
(Excluding imports)

Key factors automakers watch

- **Disposable income.**
- **Consumer confidence in the economy.**
- **Impact of the compacts.**
- **Increasing multiple-car families.**

PEG 1961 AUTO SALES at 6 million, excluding imports, and you can count yourself among the forecasters who term themselves the "realists."

Here's the spread. General Motors Corp. is predicting a 7 million year (including imports). Estimates of 5.8 million (excluding imports) are at the other extreme. Here are the factors the auto economists are watching most closely for an indication of next year's sales:

• **Spendable Income**—Most auto industry economists figure that consumer spendable income is one of the most important variables in determining how many cars will be sold in a given year. The Department of Commerce reports that disposable income has risen steadily from an annual rate of $293 billion in 1956 to $350 billion in the first half of this year. It's climbing faster than the rate of inflation. All indications are that it will continue to move upward (possibly to a $360 billion rate) in 1961.

Those statistics should mean that buyers will have a little more money to spend on cars, houses, boats, and other hard goods that make up metalworking markets. Car sales and production could be boosted several hundred thousand units.

• **Family Formations**—Byron J. Nichols, Chrysler's group vice president-auto sales, says family formations are increasing at a rate exceeding 5 per cent yearly as war babies of the 1940s get married and start their own homes. The catch: Many of these people have cars before they are married, a factor which is apparently holding back sales that economists had predicted.

But many will be buying. The big question next year is whether the new families will buy new or used cars. Builders of compact cars are hopeful because they believe price is in their favor.

• **Compact Impact**—We'll have ten U. S. built compact cars on the market in 1961—four more than this year. They're expected to account for at least 35 per cent of 1961 sales. The new models will be priced closer to Valiant and Comet than to Falcon and Corvair. In the present state of the used car market, they'll cost $150 to $200 more than used standard '60s. They'll be $400 to $600 higher than 1959 models. How willing buyers will be to pay the extra price for a new compact probably lies in how much faith they have in next year's economy.

• **Confidence Factor**—Economists admit they can't interpret or predict confidence, but all agree that consumer confidence in the economy plays a key role in how people spend their money.

One indicator (and it's only a partial answer) is the consumer debt rate. Total installment credit was a shade under $40 billion at the end of last year, figures James C. T. Mao, associate professor, Business Administration School, University of Michigan. It's expected to mount at a $4 billion annual rate through the 1960s and could reach $80 billion by 1970. About one-fourth of the increase will be used to finance car purchases. Professor Mao pre-

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dicts that 4 out of 5 households will own cars by 1970 vs. 3 out of 4 today. Probably 20 per cent of the families will have two cars instead of only 14 per cent now, he says. If you want to apply his ratio to 1961, it means another $1 billion could be spent to finance cars.

Several "ifs" also must be considered:

If defense spending increases (more likely if Kennedy gets in), the money will be quickly translated into spendable income and breed confidence.

If industry spends more capital dollars for plant and equipment, workers may be more willing to spend their money. (Chevrolet Div. is adding 2.5 million sq ft of floor space to its facilities next year).

If cold war temperatures don't rise, the public may be more apt to part with its dollars.

If all those semirelated, hard to figure factors click, car sales will perk up. They are the factors GM executives consider when they say sales can reach 7 million.

Impact on Metalworking

Metalworking should probably take the more realistic approach and figure on a 6 million production rate for passenger cars—still one of the industry's better years.

Steel mills will ship 11 million tons of steel for passenger car use alone. Another 5 to 7 million tons probably will be needed for trucks and other transportation vehicles. Spare parts mean more tonnage.

It looks like the automotive industry will use a minimum of 16 million tons of steel next year.

Compact cars are reducing the industry's steel consumption. It looks like mills will ship about 800,000 less tons of steel to auto plants next year because of the increasing demand for compacts. On the plus side, however, there is a definite desire on the part of carbuilders to schedule steel buying on a regular basis to avoid stockpiling. It should help mills control their production scheduling and eliminate serious inventory buildups of semifinished and finished steel.

● **Foundries** — Aluminum engines figure to cut into markets for gray iron castings in 1961. Present schedules indicate that 750,000 of the industry's 1961 models will have the light metal powerplants (30,000 tons of aluminum will be used in engines next year). If the cars involved used gray iron blocks, 100,000 to 150,000 more tons of these castings would have been required.

1961 Estimated Materials Consumption

U. S. Passenger Cars Only

(Tons, 000 omitted)

Steel Products*	9,300
Gray Iron Castings	1,181
Aluminum	186
Copper	105
Zinc	174
Lead	81
Galvanized Steel	48

*Does not include steel shipments for trucks and other vehicles.
Figures developed from automakers' estimates and based on average car consumption for 6 million cars.

U. S. Auto Output

Passenger Only

	1960	1959
January	688,731	545,756
February	659,323	478,518
March	654,242	576,080
April	582,909	578,846
May	611,226	546,817
June	613,147	557,995
July	434,377	555,410
August	305,527	239,152
8 Mo. Totals	4,549,482	4,078,574
September		258,151
October		507,527
November		254,527
December		494,931
Total		5,593,707

Week Ended	1960	1959
Aug. 20	47,437	31,848
Aug. 27	38,952	18,335
Sept. 3	51,647	17,261
Sept. 10	52,635	24,364
Sept. 17	85,999†	62,716
Sept. 24	125,000*	91,341

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

● **Nonferrous**—Zinc producers should hold their own, possibly gain slightly in car usage. Two years ago, the average automobile used 56 lb of zinc. The average went up to an estimated 58 lb on 1960 models, and the figure may be slightly higher in 1961 because designers are switching back to zinc for a few car parts. Imperial's headlamp housings are a good example. They'll use almost 30 lb of zinc per set.

Copper and lead will show few changes. Average per car use of copper decreased from 37 lb in 1959 to about 34 lb in 1960. It should hold at that rate in '61. Between 27 and 29 lb of lead are being used in the average car—about half goes into the battery.

● **Galvanized** — There will be a slight increase in galvanized steel consumption as Ford extends its usage from Falcon and Comet to some of its standard cars. (See STEEL, Feb. 22, p. 49). It looks like slightly more than a million cars will be using an average of 80 lb of galvanized steel per unit. As STEEL indicated last week, Chrysler is expected to begin using limited amounts of galvanized in 1962 models.

Detroit still expects General Motors to follow suit in a few years.

● **Wire**—An area that wire producers should watch: The listing wire used in headliners. Johns-Manville Corp. has introduced a stamped headliner made of plastic coated Fiberglas that is snapped under a rolled or extruded J-molding to make a sound absorbent, fireproof part. It will be introduced on one line of cars in 1961. J-M won't reveal the company's name, but it's rumored elsewhere that American Motors Corp. will have a new type sound absorbent headliner on all but its Rambler American models in 1961.

Although the materials costs are higher than those of cut and sewed headliners, J-M expects to reduce its costs as it builds up production volume. Lower prices will make the material attractive to other carbuilders. Each regular headliner uses 10 to 12 ft of listing wire. Reported usage by American Motors could mean a loss of 4 million ft of this wire in '61.

At left, Leslie Edgcomb, Jr., director of purchases for Edgcomb Steel, looks on as Joseph Drexler, vice president and general manager, checks the width of a slit strand.

Edgcomb Steel expands product range and speeds delivery with Wean slitting line

Edgcomb Steel Company, like so many other metal service centers, has noted a continuing trend toward the purchase of metals in coil form by its customers. The increasing demand for aluminum, stainless steel and carbon steel in this form is due to the lower costs realized by metal users through coil processing. Edgcomb has equipped three of its four plants with slitting lines to satisfy this requirement.

The firm's York plant was set up in 1954 around the Wean slitting line illustrated. Coils, stocked in standard widths up to 48″ and gauges ranging up to .125″, can be slit and side-trimmed quickly and economically to fill customer's orders for narrower widths. Two sets of knives, one for aluminum and one for steel, equip the line to process both metals at speeds up to 800 fpm.

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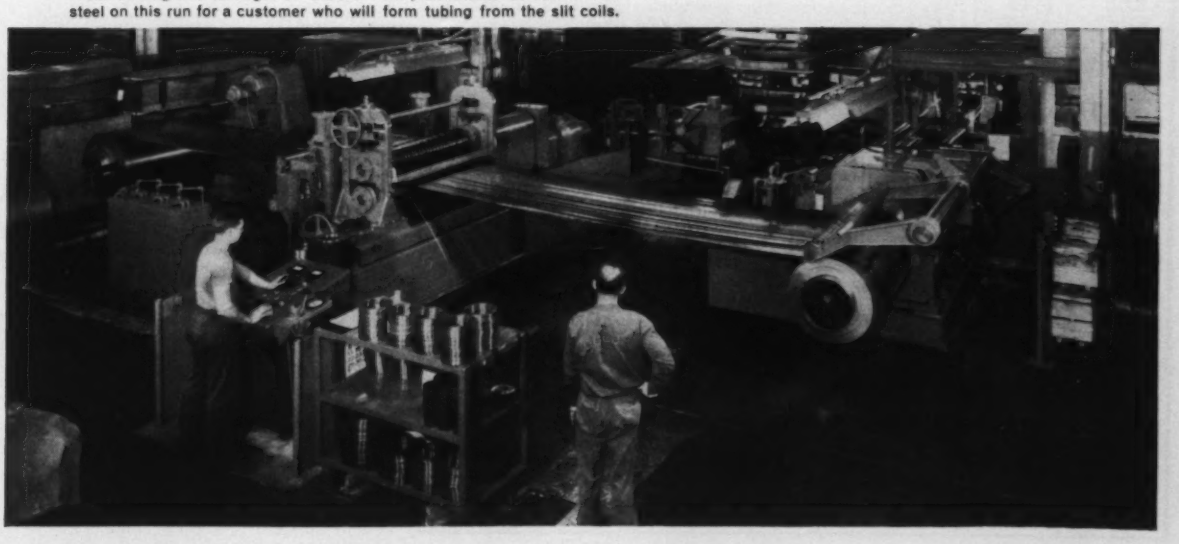
WEAN

Wean slitting line at Edgcomb Steel's York plant makes 22 cuts in mild steel on this run for a customer who will form tubing from the slit coils.



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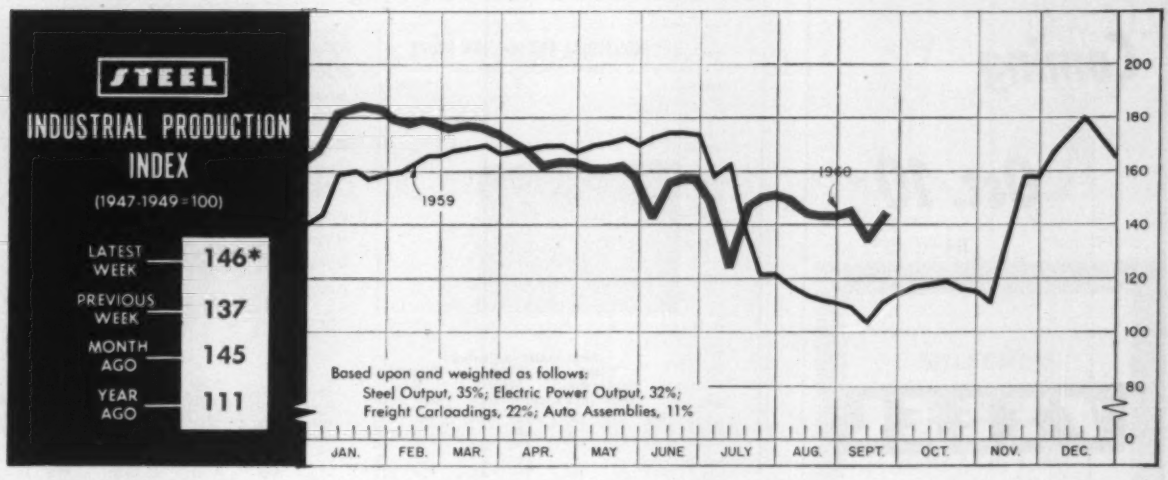

*Week ended Sept. 17.

Production Stronger than Expected

A RAY of hope flashed through clouds of doubt last week when production indexes showed unexpected strength.

STEEL's industrial production index responded to the post-Labor Day stimulus and gained 9 points, stopping just 1 point shy of the late August level. At a preliminary 146 per cent of the 1947-49 base, the reading compares favorably with past performances for the period. Here is how the index has stood immediately before and after the Labor Day week in several recent years (general economic condition in parentheses):

1959 (steel strike) .... 109 vs. 111
1958 (late recession) .. 132 vs. 135
1957 (early recession) . 155 vs. 150
1956 (boom) ..... 147 vs. 146
1955 (early boom) .... 151 vs. 152
1954 (late recession) .. 119 vs. 116
1953 (early recession) . 135 vs. 133

• **What's Normal?**—It is difficult to say that the trend line showed a normal upturn this year. While the above tabulation shows that the rise in the first week following Labor Day reached the pre-Labor Day level in three out of the seven years, economic conditions in those three years were about as different as they could possibly be.

The real test is what happens in the next two weeks of record. Using the same seven years as above for comparisons, our index was rising by the end of September in 1959, 1958, 1956, and 1955. In the other three years, the trend line declined during the month. In all cases except 1954, the September trend foreshadowed the general economic movement for the next several months.

• **Rise to Continue**—Chances of a continued rise this year are good, but as pointed out in this column last week (Sept. 19, pp. 115-117) it may well be later than usual and somewhat below seasonal standards. The two biggest factors will be steelmaking and auto production. Production schedules of steel-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,537[1]	1,510	362
Electric Power Distributed (million kw-hr)	14,100[1]	14,216	12,779
Bituminous Coal Output (1000 tons)	6,480[1]	7,590	6,414
Crude Oil Production (daily avg—1000 bbl)	6,850[1]	6,874	6,823
Construction Volume (*ENR*—millions)	$423.3	$300.8	$300.8
Auto, Truck Output, U. S., Canada (*Ward's*)	109,650[1]	67,197	86,195
TRADE			
Freight Carloadings (1000 Cars)	600[1]	481	578
Intercity Truck Tonnage (changes from year ago)	+0.4%	+0.4%	+4.5%
Business Failures (Dun & Bradstreet)	276	288	222
Currency in Circulation (millions)[3]	$32,291	$32,174	$32,197
Dept. Store Sales (changes from year ago)[3]	−2%	−1%	−8%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$26,521	$21,320	$26,183
Federal Gross Debt (billions)	$288.6	$288.7	$290.0
Bond Volume, NYSE (millions)	$18.7	$15.9	$31.8
Stocks Sales, NYSE (thousands of shares)	12,072	10,852	12,222
Loans and Investments (billions)[4]	$105 1	$104.8	$103.6
U. S. Govt. Obligations Held (billions)[4]	$27.4	$27.4	$28.9
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	247.82
STEEL's Nonferrous Metal Price Index[6]	230.0	230.0	225.3
All Commodities[7]	119.3[1]	119.4	119.6
Commodities Other than Farm & Foods[7]	128.2[1]	128.3	128.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1960, 2,849,306; 1959, 2,831,846. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

Coming

Oct. 10

IN

STEEL

The 1960 Edition Of Your Metal Selector

This is the most up-to-date source of information on standard and special metals available anywhere. What's more, it's designed to help the busy metalworking manager select the right material for every job.

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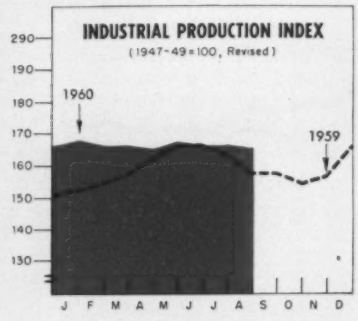
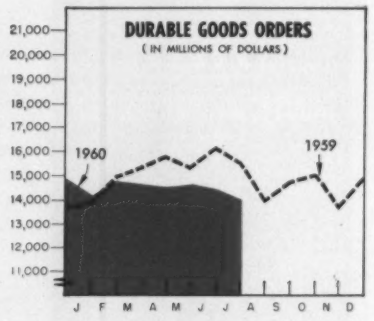
- More than 1000 products, their compositions, and applications are listed. Producers are named to help you find suppliers.
- The Metal Selector is one of STEEL's continuing services for its readers.

THE BUSINESS TREND





(Seasonally adjusted)

	Total Production		Total Mfg.		Durables Mfg.	
	1960	1959	1960	1959	1960	1959
Jan.	168	152	168	150	181	156
Feb.	166	155	166	153	178	160
Mar.	166	157	165	156	175	165
Apr.	165	162	164	161	172	170
May	167	166	166	165	174	177
June	166	166	165	166	171	178
July	166	163	165	163	172	171
Aug.	165*	157	164*	156	170*	158
Sept.	...	157	...	156	...	157
Oct.	...	154	...	153	...	155
Nov.	...	155	...	154	...	155
Dec.	...	165	...	164	...	174
Avg	...	159	...	158	...	164

Federal Reserve Board. *Preliminary.
Charts copyright, 1960, STEEL.

	New Orders*		Sales*	
	1960	1959	1960	1959
Jan.	14,190	13,900	15,450	13,541
Feb.	14,800	14,918	15,670	13,870
Mar.	14,640	15,323	15,170	14,400
Apr.	14,470	15,796	15,000	15,166
May	14,680	15,241	15,060	15,515
June	14,340	16,133	14,880	15,771
July	14,060†	15,493	14,810†	15,384
Aug.	.....	13,974	.....	14,008
Sept.	.....	14,747	.....	14,113
Oct.	.....	15,099	.....	14,047
Nov.	.....	13,721	.....	13,479
Dec.	.....	14,770	.....	15,010

*Seasonally adjusted. †Preliminary.
U. S. Office of Business Economics.

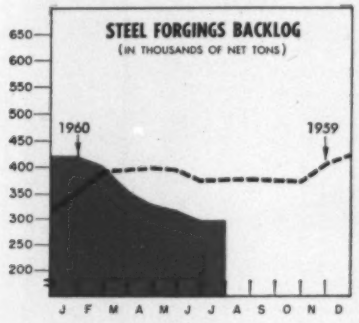
makers are still lagging. Not long ago, it was felt that the national operating rate would be close to the 60 per cent mark by now. But it was only 53.9 per cent during the week ended Sept. 25. It will probably inch up week by week until late in the fourth quarter, but don't look for any spectacular spurts.

In motordom, some of the concern about the 1960 model cleanup was eased early this month when sales once again climbed above the year-ago pace. But even if the rate were to continue, the chances are good that new model buildup will push total inventories to the 850,000 unit level on Oct. 1—a record, says *Ward's Automotive Reports*. However, producers can't be losing too much sleep over the problem because they still plan to build about 640,000 units in October; and they expect a hefty November and December. If they're right, industrial production indexes might come close to their seasonal climbs, but not many people are betting on it.

• **On the Other Side**—Counteracting some of the up pressure will be seasonal declines in both electric output and railroad freight carloadings. The two indicators tend to reflect industrial activity as a whole. Any general dropoff in manufacturing activity will show up here quicker than in steel or auto production, so watch them closely in the next few weeks. Here is what to look for:

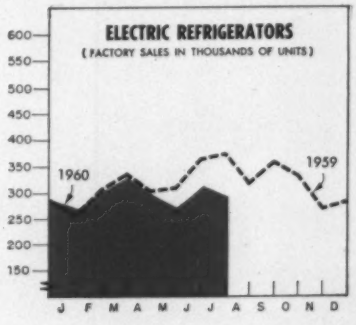
In output of electricity, the trend is usually down slightly following Labor Day until well into November. Following Thanksgiving, there is a sharp pickup until a seasonal peak—often a record—is reached just before Christmas. If the upturn is less than seasonal, it usually means that industry is not up to par because residential and commercial use is certain to increase as cold weather and Christmas close in.

For freight carloadings, the pattern is also seasonal, rising through October until the Great Lakes shipping season comes to a close. (The closing date often reflects the steel industry business: Early closing, slack steel demand.) Then there is a significant decline, followed by gradual, but small, increase into mid-December. Variations from the pattern are usually caused by weakness or strength in the miscellaneous category—largely manufactured goods.



	Shipments		Unfilled Orders	
	1960	1959	1960	1959
Jan.	123	113	420	353
Feb.	130	113	398	392
Mar.	138	129	356	396
Apr.	117	136	325	398
May	110	142	312	394
June	110	140	295	375
July	79	103	295	377
Aug.	...	98	...	376
Sept.	...	103	...	374
Oct.	...	97	...	373
Nov.	...	87	...	405
Dec.	...	114	...	420

U. S. Bureau of the Census. Data based on reports from commercial and captive forge shops with monthly shipments of 50 tons or more.



	1960	1959	1958
Jan.	266,700	256,200	206,100
Feb.	302,400	306,200	227,800
Mar.	338,100	333,700	261,100
Apr.	294,000	301,000	210,800
May	268,000	308,200	262,900
June	308,500	361,000	316,300
July	291,500	370,800	279,700
Aug.	.....	314,100	245,900
Sept.	.....	355,700	295,200
Oct.	.....	329,600	277,500
Nov.	.....	265,900	245,500
Dec.	.....	282,600	286,900
Totals	.....	3,785,000	3,116,700

National Electrical Mfrs. Assn.

FRB Index Off Just 1 Point

The Federal Reserve Board's industrial production index for August was also somewhat of a surprise. It declined 1 point to a seasonally adjusted 165 per cent of the 1947-49 base period (see graph and table, Page 84), but many observers had expected at least a 2 point decline. Reasons: The decline in employment in August, a less than seasonal rise in steel production, and an earlier than usual model changeover in the auto industry.

For the FRB index, too, September has been pivotal in recent years. If it does not rise this month, chances are that the final months of 1960 will be pretty dull.

If you're looking for clues to the direction the FRB index will take this month, keep your eye on STEEL's production trend line. Generally, they follow similar paths. In the last seven years, only 1959 (STEEL's trend line advanced, FRB's held even) and 1954 (STEEL's trend line declined and FRB's turned up) have been exceptions to this rule.

The uncertainty in today's business situation leads the National Association of Credit Management to comment: "If we could worry ourselves into a recession, we would be pretty close to one now." However, the association does not feel that a recession is close. "Caution is called for, certainly. But there is nothing to warrant serious apprehension (in banking, steel, and autos, which are causing the most concern).

"The standbys are still with us, strong and sturdy enough to keep the old economy from creaking at the joints," the association claims. It lists consumer disposable income and confidence; steady new equipment and plant orders; an upswing in housing activity; and a federal highway program that is in high gear.

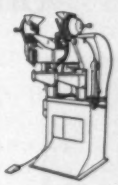
Prentice-Hall Inc., Englewood Cliffs, N. J., declares that the post-Labor Day order upturn has been both less than seasonal and smaller than expected, pretty much across the board. "Any lingering hopes of the optimists that last January's high in industrial production could be recaptured this winter have now been pretty well dashed by unofficial reports by some of the nation's leading corporations on their third quarter sales and profits."

Model 423

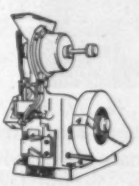
Model 250

MILFORD'S
FLEXIBLE
RIVETER LINE
CAN HELP CUT
YOUR ASSEMBLY
COSTS

Milford adapts to your production line with a wide range of automatic riveters designed to cut assembly costs. Count on Milford's versatility to come up with answers you need at substantial cost savings over other fastening methods. Write for more information.


Model 72

Model 53


Model 52-S-55

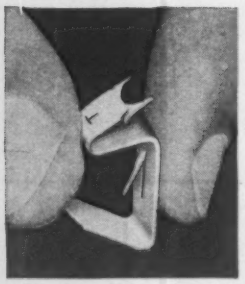
Model 56

THE MILFORD RIVET & MACHINE CO.

MILFORD, CONNECTICUT • HATBORO, PENNA.
ELYRIA, OHIO • AURORA, ILL. • NORWALK, CALIF.

Another SPEED NUT Savings Story...

62% cost reduction made with **SPEED CLIPS**® on Cramer Posture Chairs



A dozen SPEED CLIPS now do the job of fastening upholstery to the steel seat of Cramer Posture Chairs. Before the switch to Tinnerman SPEED CLIPS, an expensive formed-steel rim was spot-welded to the seat to do this job.

SPEED CLIPS save Cramer at least 46 cents—or 62% of fastening cost—on each chair ... they eliminate the rim-forming and spot-welding operations... permit faster, easier assembly... simplify disassembly if the chair ever needs re-upholstering. Working jointly with Cramer's engineering staff, Tinnerman fastening specialists were able to provide all these advantages without sacrificing product quality.

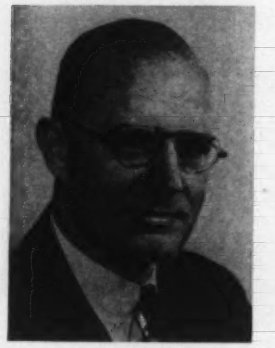
Assembly costs on your product are likely to benefit greatly, too, if you'll enlist the aid of this Tinnerman team. You can arrange for a free FASTENING ANALYSIS of your product simply by calling in your nearby Tinnerman representative. You'll find him listed in the "Yellow Pages" and in Sweet's PD File under "Fasteners." Or write direct to:

TINNERMAN PRODUCTS, INC.
Dept. 12 • P. O. Box 6688 • Cleveland 1, Ohio

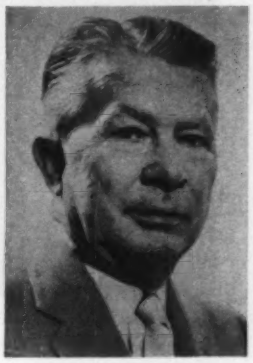
TINNERMAN
Speed Nuts®

FASTEST THING IN FASTENINGS®

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S. A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano-Bundy GmbH, Heidelberg.

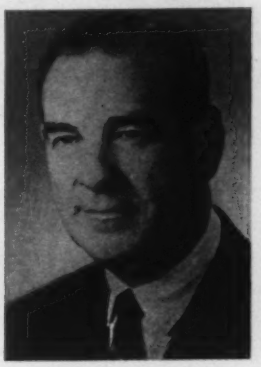


LAWRENCE LITCHFIELD JR.
Alcoa president



S. M. HOPKINS
National Can president

LOUIS K. WHITCOMB
Wheeling Steel market research



HILLIARD Y. SMUCK
Quaker State Metals gen. mgr.

Lawrence Litchfield Jr. was elected president of **Aluminum Co. of America**, Pittsburgh. He succeeds **Frank L. Magee**, elected chairman. **I. W. Wilson**, retiring chairman, was named chairman of the newly formed finance committee. Mr. Magee continues as chief executive officer. Mr. Litchfield, in 1959, was made one of three executive vice presidents, and was given responsibility for Alcoa's four operating divisions, as well as for its engineering, purchasing, and traffic activities.

William A. Garret was appointed director of purchases, **Huck Mfg. Co.**, Detroit. He was a senior buyer with Thompson Ramo Wooldridge Inc. in Cleveland.

Herbert D. Burdick was appointed general sales manager, **Cleveland Cap Screw Co.**, Cleveland, subsidiary of Standard Pressed Steel Co.

Edward A. Puchalski was named sales manager for **Milwaukee Crane Div.**, Milwaukee, Novo Industrial Corp.

J. B. Kopec was made director of research and metallurgy at **Keystone Steel & Wire Co.**, Peoria, Ill., a new post. He was metallurgical engineer, John A. Roebling's Sons Div., Colorado Fuel & Iron Corp.

George N. Stuart was made works manager, **Seymour Mfg. Co.**, Seymour, Conn.

George Kappelt was made director of engineering laboratories for **Bell Aerosystems Co.**, Buffalo.

S. M. Hopkins was elected president, **National Can Corp.**, Chicago, succeeding **J. B. Wharton Jr.**, resigned. **Harry N. Eidswick** and **Frank O'Brien Jr.** were elected vice presidents. Mr. Hopkins has been with National Can since the company acquired Pacific Can, of which he was vice president-sales.

Louis K. Whitcomb was named director of market research at **Wheeling Steel Corp.**, Wheeling, W. Va. For the last 12 years, he was with Sharon Steel Corp., and was director of marketing there.

Milton Mill was elected executive vice president of **Hubbell Metals Inc.**, St. Louis. He was vice president-sales. **N. Alden Rehnquist** was made stainless steel product manager, continuing in charge of the Processing Dept. **Woodson P. Smith** takes over steel production-sheets from Mr. Rehnquist, and is now responsible for carbon steel, prime and secondary.

Donald C. Barnum was named manager of industrial relations for **Bethlehem Steel Co.**, Bethlehem, Pa. He succeeds the late **Daniel C. Mills.**

Philip P. Craighead joined **Brooks & Perkins Inc.**, Detroit, as manager of its new Military Structures Div. He was president of Magnesium Products, Milwaukee, subsidiary of May Steel Products Inc.

Louis A. Exner was promoted to director of contracts, Propellex Div., **Chromalloy Corp.**, Edwardsville, Ill.

Hilliard Y. Smuck was appointed chief executive officer and general manager, **Quaker State Metals Co.**, Lancaster, Pa., division of Howe Sound Co. He was vice president and general sales manager. **Thomas M. Zimmerman** was appointed executive vice president. He was vice president-manufacturing.

Gershon I. Salhanick was made quality control manager for **National Pneumatic Co. Inc.**, and **Holtzer-Cabot Divisions**, Boston. He was quality manager at Thompson Ramo Wooldridge's Boston plant.

James W. Cunnington was appointed vice president-general manager, **Durham Mfg. Corp.**, subsidiary of National Union Electric Corp., Stamford, Conn.

Earl A. Danciu was made manager, original equipment sales, **Alemite & Instrument Div.**, Chicago, Stewart-Warner Corp.

Allis-Chalmers Mfg. Co. made these appointments in its Centrifugal Pump Dept., West Allis, Wis., Works: **Joseph J. Jacobs** chief engineer, **C. L. Babb** senior staff engineer, and **W. W. Weltmer** senior development engineer.

George L. Miller was named purchasing agent, **Firth Sterling Inc.**, Pittsburgh. He succeeds **Harry K. Stern**, retired. Mr. Miller, who joined the company 35 years ago, has been assistant purchasing agent.

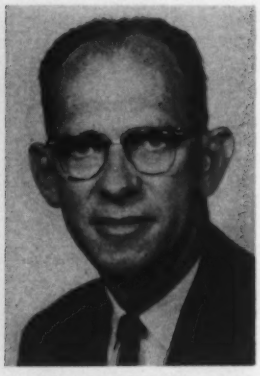
Anaconda Sales Co., New York, appointed **David J. Rowland** assistant sales manager for zinc and lead; **Robert E. Eisenreich** assistant sales

FRANK H. SAWONIK

DAVID HUGHES

Hickok divisions vice presidents

RICHARD ALLCHIN



L. W. DWORS

Rotor Tool president, v. p.-manufacturing

manager, ferromanganese and manganese nodules.

Hickok Electrical Instrument Co., Cleveland, created two new divisions. **Frank H. Sawonik**, former vice president-government sales, was named vice president and sales manager of the Industrial Instrument & Government Div. **David Hughes**, former marketing director, was elected vice president and general manager, Meter & Controls Div.

Kenneth E. Norris was made assistant superintendent, Central Mills Div., **United States Steel Corp.** He succeeds **Royal Scovill**, recently made assistant superintendent of the new General Services Div. at the Gary, Ind., Steel Works.

Thomas A. Cleary Jr. was named assistant superintendent, flat rolled and tubular products, **Youngstown Sheet & Tube Co.**, Youngstown. He was assistant superintendent of the Open Hearth Dept. at the Brier Hill plant, and succeeds **Jack E. Major**, recently made assistant general superintendent of the steel plant and Struthers Works.

C. A. Gunn was made government sales manager, Wire & Cable Div., **Copperweld Steel Co.** He has headquarters in Chicago.

Virgil W. Wall was made director of engineering, Electronic Systems Div., Hollywood, Calif., **Telecomputing Corp.**

George R. Fox, works manager of **Joy Mfg. Co.** plants in Franklin, Pa., was elected vice president of manufacturing for **Joy International S. A.**, subsidiary. **C. A. Patten** was made works manager of the New Philadelphia, Ohio, plant, and is replaced by **Jack K. Adams** as manufacturing manager, Franklin plants.

Robert F. Myers was made sales manager, **Productive Tool Service Inc.**, Cleveland. He served as general sales manager with Lees-Bradner Co., and sales manager, Machinery Mfg. Div., Motch & Merryweather Machinery Co.

Lee B. Warstler was named assistant general sales manager, Stainless & Strip Div., **Jones & Laughlin Steel Corp.**, in Detroit.

T. Webster Matchett, former manager of the Caldwell plant in Chicago, **Link-Belt Co.**, was made general manager of the Pershing Road plant there. He is succeeded by **George Ramsden**, general manager of the North Central Div. in Minneapolis. **Gerald A. Stone**, district manager of the Dallas office and factory branch store, succeeds Mr. Ramsden.

Richard Allchin was named president of **Rotor Tool Co.**, Cleveland, subsidiary of Cooper - Bessemer Corp., succeeding **H. P. Bailey**, founder of the firm, now chairman. **L. W. Dwors** was appointed vice president-manufacturing. **Hugh L. Whitehouse** was made director of engineering, and secretary-treasurer.

John E. Schork was made director of manufacturing, **Research-Cottrell Inc.**, Bound Brook, N. J.

Industro Transistor Corp. named **Robert W. Pike** chief engineer in charge of research and development at its Semiconductor Research & Development Center, Natick, Mass.

Joseph F. Perko fills the new post of supervisor of customer service, Tin Mill Products Div., **Weirton Steel Co.**, Weirton, W. Va., division of National Steel Corp. **James W. Taylor** retired as assistant manager-tin plate sales.

Dr. Cataldo Cialdella was made di-

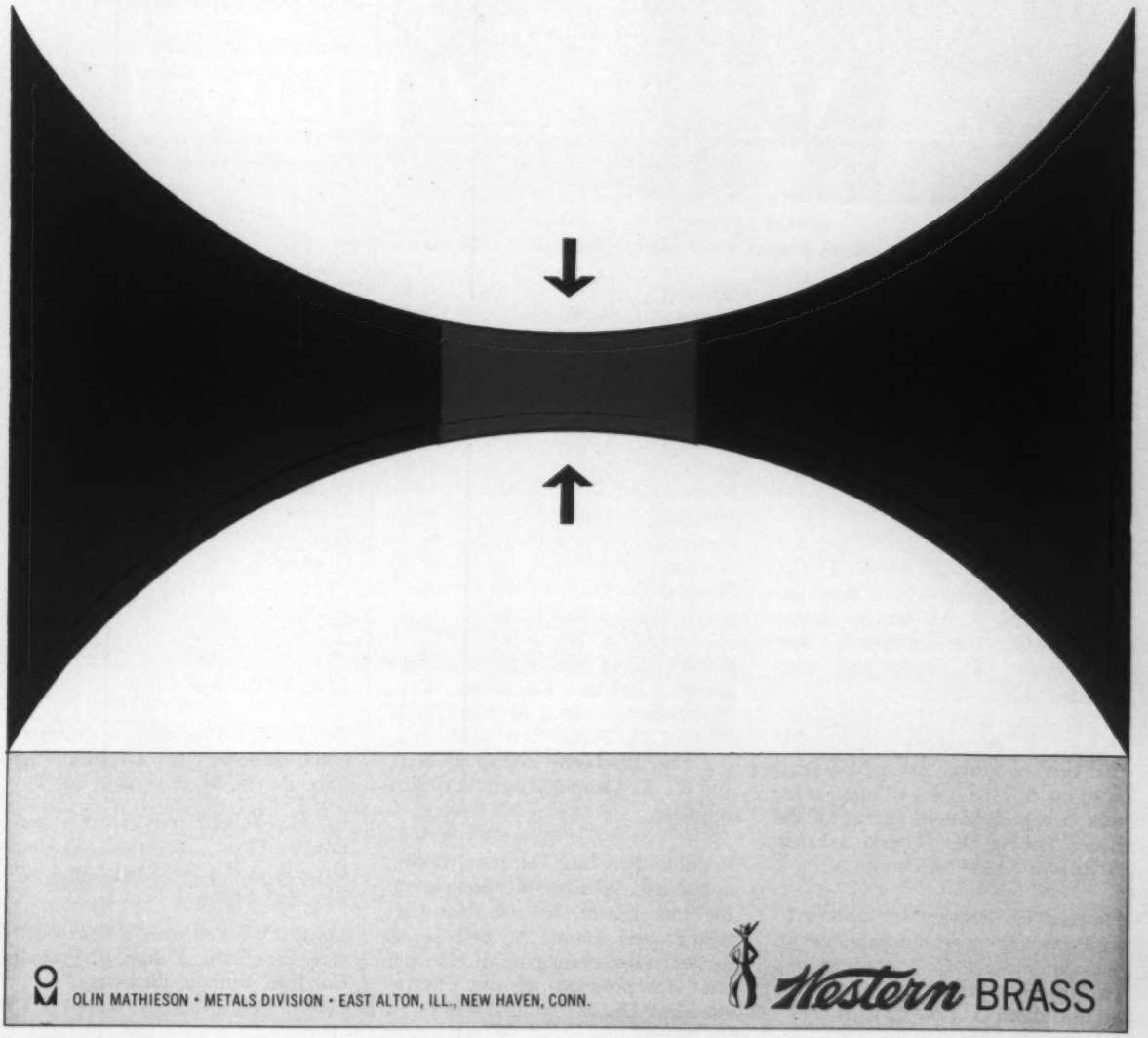
T. WEBSTER MATCHETT

GEORGE RAMSDEN

GERALD A. STONE

general managers for Link-Belt plants

You'll make better connections with **Western Brass**, because brass is easily—and firmly—welded, brazed, or soldered. With Western Brass you have the added confidence that comes from working with metallurgical specialists who analyze your blueprints to guarantee that you get sheet or strip in the right alloy, temper, grain size, gauge, and finish. You'll make it better with easy-to-bond brass. And you'll make it best with Western Brass—it's "tailor-made" to your individual requirements.



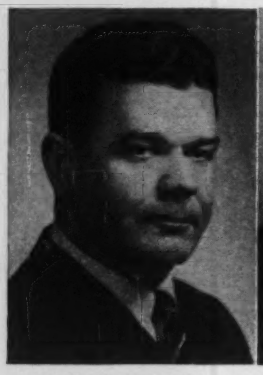
OLIN MATHIESON • METALS DIVISION • EAST ALTON, ILL., NEW HAVEN, CONN.

Western BRASS

HERBERT L. WILLKE
National Supply eng.-dir.

WILL MITCHELL JR.
A-C acting dir.-research

GEORGE S. ARNESON
Delta-Star marketing dir.



HOMER C. LACKEY
Erie Forge president

EDWARD S. BUNN
Revere Research & Dev. post

THOMAS E. DALBY
fills new post at Bethlehem

rector of research and development, **Hysol Corp.**, Olean, N. Y.

Homer C. Lackey was elected president and chief executive officer of **Erie Forge & Steel Corp.**, Erie, Pa. He had been manager-forged products, United States Steel Corp., Pittsburgh.

Joseph J. McGuire was appointed factory manager at **Mack Trucks Inc.'s** West Front Street facilities, Plainfield, N. J. He was in charge of planning the company's new Hagerstown, Md., engine and transmission plant.

Robert E. Shamburg was made manager of tubing sales, **Mid-West Forging & Mfg. Co.**, Chicago. He was vice president in charge of the Espro Tubing Div., Union Asbestos & Rubber Co.

Howard O. Beaver was appointed assistant general superintendent, **Carpenter Steel Co.**, Reading, Pa. He was manager of mill metallurgy at the plant.

Edward S. Bunn, chief metallurgist, **Revere Copper & Brass Inc.**, New York, was made general manager of the Research & Development Dept. in Rome, N. Y.

Thomas E. Dalby, assistant manager of structural shape sales, **Bethlehem Steel Co.**, Bethlehem, Pa., was named manager of sales engineering, a newly created division in the Sales Dept. He is succeeded by **Edward D. Waldron III**, formerly a salesman in the division.

Frank Tencza was made chief engineer, **Robins Engineers Div.**, Hewitt-Robins Inc., at New York. **Edward H. Fallon** was made construction manager of the division, and **F. X. Connelly** assistant chief engineer.

Republic Foil Inc., Danbury, Conn., appointed **William K. Hooper** to the new post of vice president-marketing, and **Henry A. Bell Jr.** to general sales manager. Mr. Hooper was vice president of the Electrochemical Div.

Herbert L. Willke was appointed director of engineering for **National Supply Co.**, Pittsburgh. Former assistant director of engineering, he succeeds **Joseph R. Mahan**, retired.

Will Mitchell Jr. was made acting director, Research Div., **Allis-Chalmers Mfg. Co.**, Milwaukee. He succeeds the late **Dr. H. K. Ihrig.** Mr. Mitchell was research supervisor.

George S. Arneson was appointed director of marketing, **Delta-Star Electric Div.**, Chicago, H. K. Porter Company Inc. He joined the Porter organization in Pittsburgh several months ago. He was general manager, Capital Equipment Mfg. Div., Borg-Warner Corp.

Kirk P. Harger was made Eastern sales manager, Steel Products Div., New York, **Kerotest Mfg. Co.**

Nathan Miksch was elected president of **Newark Die Co.**, Newark, N. J.

Dr. William Beacham joined **Ionic Electrostatic Corp.**, Garfield, N. J. He was with Binks Mfg. Co. for 16 years.

Samuel A. McMullan joined **Charles E. Schuler Engineering Co.**, Newark, Ohio, as sales manager.

Gilbert T. Bowman was named to head the reorganized International Div. of **Rockwell Mfg. Co.**, Pittsburgh. He was vice president, Meter & Valve Export Div.

Charles H. Bell was made manager of the New Programs Group of **American Machine & Foundry Co.'s** Greenwich, Conn., Engineering Div. He succeeds **John N. Albaugh.**

OBITUARIES...

Donald F. Fraser, 47, vice president-manufacturing of **Garlock Inc.**, Palmyra, N. Y., died Sept. 12.

E. H. Falbe, purchasing agent, **Emcor Dept.**, Ingersoll Products Div., Borg-Warner Corp., in Elgin, Ill., died Sept. 11.

Martin W. Pohlman, 64, executive vice president, **Pohlman Foundry Co. Inc.**, Buffalo, died Sept. 7.

prediction

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NEW DEVELOPMENTS IN AUTOMATED STEELMAKING

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BE ONE OF 15,000 WHO WILL ATTEND to see and hear discussed the many advanced developments of today that will be standard operating practice in the future. Four full days of technical sessions (42 in all) will be held concurrently with AISE's largest Exposition (206 exhibitors, 15% more area than the largest previous show).

No man concerned with steelmaking or plant maintenance can afford to miss this opportunity of reviewing *the new, the technical, the significant!*

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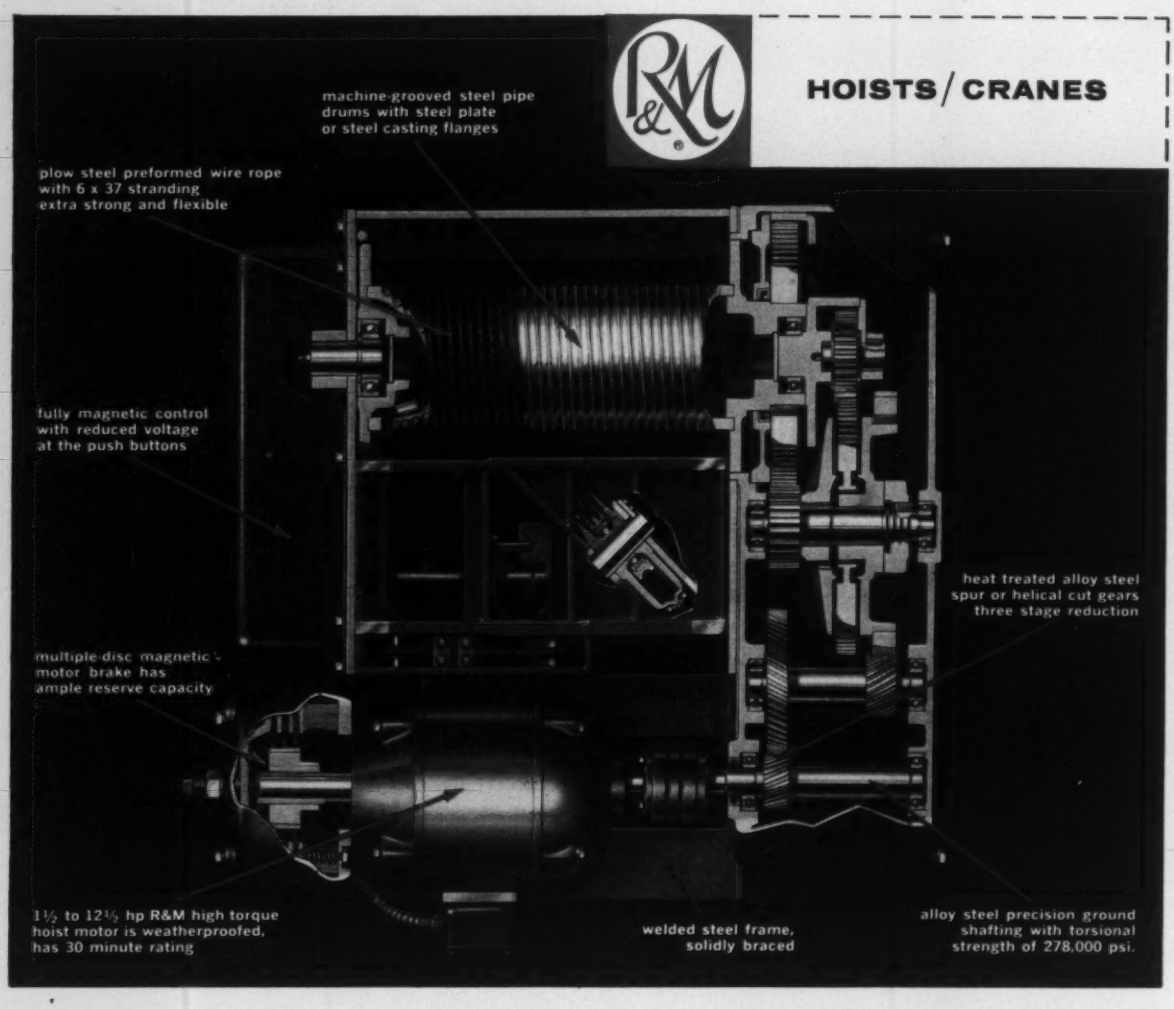
machine-grooved steel pipe drums with steel plate or steel casting flanges
plow steel preformed wire rope with 6 x 37 stranding extra strong and flexible
fully magnetic control with reduced voltage at the push buttons
multiple-disc magnetic motor brake has ample reserve capacity
1½ to 12½ hp R&M high torque hoist motor is weatherproofed, has 30 minute rating
welded steel frame, solidly braced
heat treated alloy steel spur or helical cut gears three stage reduction
alloy steel precision ground shafting with torsional strength of 278,000 psi.

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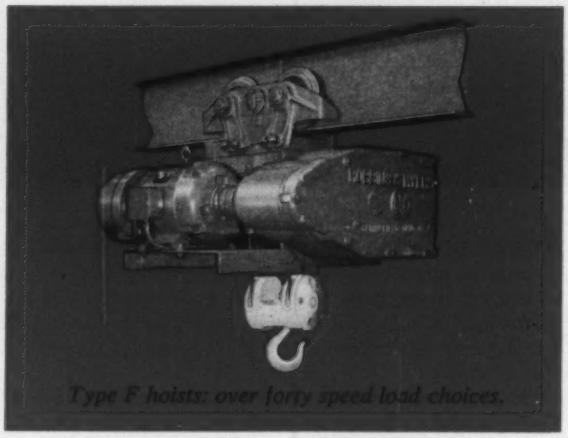
HOISTS / CRANES

LOW HEADROOM HOIST FOR HARD USE

Robbins & Myers heavy duty Type F hoists have compact, beam-hugging profiles to save overhead space in your plant. For example, the F-2 has a headroom of only 17", yet provides 2 ton lifts on a path of steel extending from beam to hook. And F hoists are built for toughest use: frame is welded steel, alloy steel gears are heat treated, ball and roller bearings are used throughout. Weatherproof R&M 220/440 v.a.c. motors—to 12½ hp—drive through three gear reductions. These are the hoists to choose for day-after-day production lifting where maximum dependability is important. You can standardize on F hoists throughout your plant because the line is as economical as it is broad: capacities—½ to 10 tons, mounting—lug, plain or geared hand trolley, 3 types of motorized trolleys. Request Bulletin 920. Hoist & Crane Division of Robbins & Myers, Inc., Springfield, Ohio or Brantford, Ontario.



ROBBINS & MYERS

hoists & cranes, Moyno® pumps, motors, Propellair® fans

Big Inch Pipe Mill Opens in Alberta

BIG INCH Pipe Corp. has started operation of its continuous pipe mill at Calgary, Alta. The mill was designed to fabricate large diameter, high strength, transmission line pipe for oil, gas, and water. The mill can produce pipes 18 to 36 in. OD, with a wall thickness of 3/16 in. to 5/8 in.

Sixty ft lengths of steel plates are trimmed to required width, moved by crane, and fed into the forming mill. These operations are done on a continuous basis: The formed open seam is brought to the welding head where it is forge welded via high frequency electric resistance, then scarfed inside and out, sized, and delivered to the runoff table. The high frequency resistance welder was made by the Thermatool Corp., a subsidiary of New Rochelle Tool Corp., New Rochelle, N. Y.

The mill's capacity is about $50 million to $60 million worth of pipe a year. On Aug. 5, the Federal Power Commission authorized the importation of gas to the U. S. from Canada's Alberta fields. The 400 miles of 36 in. lines that will carry gas to the border will utilize about 180,000 tons of steel.

Big Inch expects to supply the major portion of this pipe from its $4 million plant. Officials of the firm include: R. W. Diamond, chairman; J. W. Sharp, president; J. N. Turvey, secretary-treasurer; S. D. Turner, general manager; and H. E. Coldwell, plant engineer.

Inland Expands Plant

Inland Steel Co., Chicago, has completed an extensive 18 month modernization and expansion program at its Chicago Heights, Ill., Works. The plant's annual capacity has been boosted 75 per cent to 140,000 tons (concrete reinforcing bars, fence posts, subpurlins, merchant bars, automobile bumper brackets, jacks, and special sections for agricultural implements). The rail rerolling mill has been repowered and re-equipped to produce more merchant bar products from billets, adding to the capacity of Inland's merchant mills at its Indiana Harbor (Ind.) Works.

Reynolds Installs Press

Reynolds Metals Co., Richmond, Va., is adding 55,000 sq ft of floor space to its Bellwood, Va., extrusion plant to house a huge press and associated equipment. Cost: More than $1 million, not including cost of furnace and finishing equipment and additions to the die shop.

The new press will enable the plant to produce extruded shapes up to 14 in. in diameter and will bring the facility's monthly production capacity to more than 3 million lb of extruded products. It will be able to exert a pressure of 9 million psi. The press weighs about 625 tons and is 150 ft long.

Concord Steel Moves Unit

Concord Steel Corp., New York, moved its Philadelphia operation to its new location at 1701 Palmyra Rd., Pennsauken, N. J. The branch is under the management of Lewis Hart. The plant contains 20,000 sq ft of floor space and is equipped with cranes and machinery to serve users of hot rolled steel products.

Research Center Planned

A. O. Smith Corp., Milwaukee, will build a $2 million advanced research center at Middleton, Wis. The 50,000 sq ft facility is scheduled for occupancy by mid-1961. The building will house new laboratories for research in the physics and chemistry of materials. New methods for storing and converting energy will also be explored.

Dravo Gets French Order

Dravo Corp., Pittsburgh, has signed a contract with Dayde Co., Paris, France, and La Societe des Forges et Ateliers du Creusot (SFAC-Usines Schneider) for two ore unloaders to be erected at the port of Dunkirk, France. An option for a third unloader is included. The unloaders will serve the new Dunkirk plant of USINOR, a French steelmaking firm. Each unloader

(*Please turn to Page* 96)

"Workhorses" for precision drilling

Nine standard Delta drill presses do small lot precision work at the Armaments Division of Universal Match Company, St. Louis. Regular and power feed 20" drill presses, 17" models and the 14" Super-High Sensitive drill press are used in set-ups that suit the tool to the work. By exploiting the adaptability of these versatile tools, Universal gets far more productivity and quality than the low cost would indicate is possible. This is typical of the way accurate, rugged Delta Industrial Tools are being used to supplement or replace costly conventional tooling. For free booklet of cost cutting ideas, write: Rockwell Manufacturing Company, Delta Power Tool Division, 638J N. Lexington Ave., Pittsburgh 8, Pa. In Canada: Rockwell Manufacturing Company of Canada, Ltd., Guelph, Ontario.

McKAY

Revolutionary New McKaymatic* Die Shear Line boosts production ...cuts scrap loss for Eastern Stainless!

Photo by Arnold Newman shows (seated left to right) W. F. Schneid, vice president—general manager, and H. J. Verner, chief engineer of Eastern Stainless Steel Corp., discussing cost reductions in stainless steel processing with (standing) McKay Machine sales engineer Robert D. Lynn, in front of the McKaymatic* Die Shear Line recently installed in Eastern's cold strip department.

"We consider the McKaymatic* the finest advancement in shearing to come along in a great many years," says W.F. Schneid, vice president-general manager, of Eastern Stainless Steel Corporation, Baltimore, Md. "We have reduced production time, cut our scrap loss, and have recorded an overall increase in department efficiency as a direct result of this new McKay die shear line," Mr. Schneid continues.

Eastern Stainless is a prime supplier of stainless steel sheets, strip and plates, for aircraft and missile parts, for food, chemical, paper and textile machinery and for architectural uses. It produces 25 grades of stainless steel in its own modern electric furnace facilities, and ships about sixty-six percent of it in sheet form.

Programs many grades instantly—Through improved roller leveler techniques, Eastern Stainless found it was able to instantly program many grades of sheet through its new McKaymatic* Die Shear Line. The line decoils, levels in a 17-roll McKay Roller Leveler, measures by electronics and cuts to length—replacing a cut-up, re-level, and re-square operation prior to boxing. Production of cut lengths has been substantially increased.

The result, they report, is cost savings. Says Mr Schneid: "As a result of our efforts to improve customer service, we installed this line to speed up production of these cut lengths. It has enabled us to break a production bottleneck for which there seemed to be no solution."

Line eliminates stretcher leveling—Mr. Schneid continued that production time has been reduced on sheets of five grades as a result of being able to eliminate stretcher leveling and re-squaring procedures. Also, he said, the scrap loss on re-squaring has been eliminated as the sheets are cut clean and square on the McKay line. Net effect of the installation was a definite increase in overall departmental efficiency.

H. J. Verner, chief engineer, remarked that the McKay roller leveler could process these grades of stainless, within its capacity, to flatness approaching that obtained from the stretcher method. He reported that the Die Shear Line is being used to prepare for shipping cold rolled sheet from 4" to 48" in width, up to .050" in thickness, and in lengths from 36" and greater at normal production speeds. He particularly likes the McKaymatic* Die Shear Line for its ability to handle high finish stainless without edge or surface damage.

Available in many sizes—The McKaymatic* Die Shear Line is available in sizes to accommodate most commercial widths. Composed of decoiler (with coil car, if desired), roller leveler, measuring device, and cutoff press, it satisfies most requirements for sheet length accuracy and squareness, flatness, edge and surface quality protection and output rate.

For short runs or long, the McKaymatic* Die Shear Line will better any other line in economy and efficiency. Whatever your cut-to-length problem, McKay Machine's engineers have a solution. Write for literature; send your specific needs for a quotation to *McKay Machine Company, Youngstown 1, Ohio.*

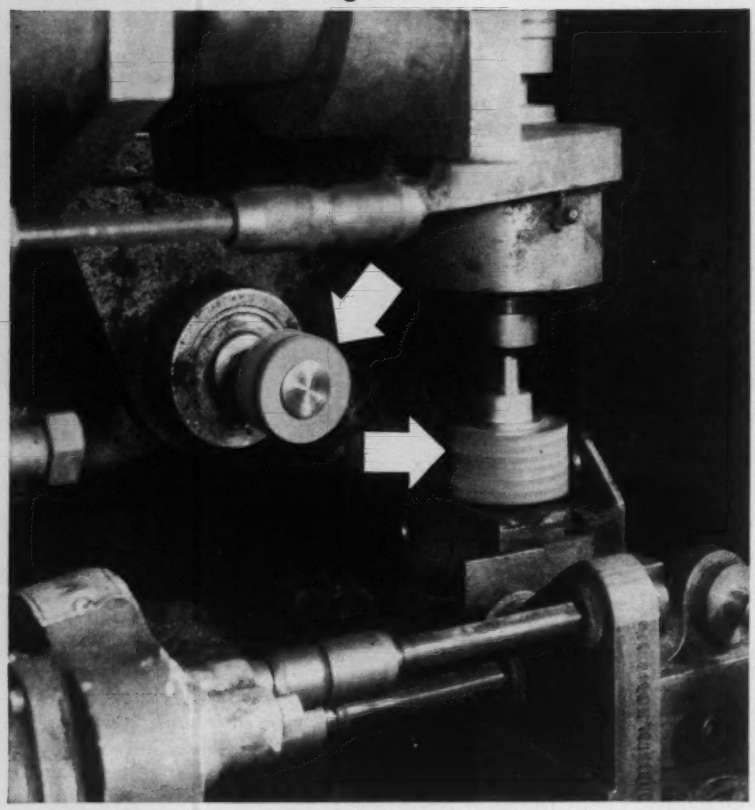
*TM

LOOK TO

McKAY MACHINE

FOR PROGRESS IN METAL PROCESSING

FLASH . . . *it's gone* . . .



TWELVE OSBORN TY® RINGLOCK BRUSHES are mounted in two six-stack units on each spindle-head of this specially-built machine. Operating in two planes at 3600 rpm, these Osborn Power Brushes rapidly remove rubber flash from four areas of rubber-bonded-to-steel motor mounts.

FAST *with Osborn power brushing*

Here's how this manufacturer of automotive components licked the problem of troublesome flash removal on rubber-bonded-to-steel motor mounts.

A specially-built automatic machine was equipped with two spindle-heads of Osborn TY® Power Brushes that index and operate in two different planes. The operation quickly, economically removes flash from four areas of each part in just 12 seconds—a vast improvement over slow, costly offhand methods.

Modern Osborn Power Brushing methods can eliminate problems in deburring . . . cleaning . . . polishing . . . precision blending and micro finishing. An **O**sborn **B**rushing **A**nalysis—made in your plant now at no cost—is the first step toward lowering production costs and improving quality. For details, write *The Osborn Manufacturing Company, Dept. S-26, Cleveland 14, Ohio.*

Osborn Brushes

OSBORN

Metal Finishing Machines . . . and Finishing Methods
Power, Paint and Maintenance Brushes
Foundry Production Machinery

(*Concluded from Page 93*)

will be equipped with a bucket of 14.8 net tons capacity.

Edgcomb Enlarges Property

Edgcomb Steel Co., Philadelphia, purchased about 3.5 acres of land and buildings at "B" Street below Erie Avenue recently occupied by Globe Battery Co. The property adjoins that of the present Edgcomb plant and will provide additional space for the stocking of metals. The 55,000 sq ft of floor space will be occupied early in 1961.

Hydraulic Line Broadened

Racine Hydraulics & Machinery Inc., Racine, Wis., has entered into a cross-licensing agreement with Vickers - Armstrongs (Engineers) Ltd., a subsidiary of Vickers Ltd., London, England. The reciprocal agreement with Vickers adds large, high pressure equipment to the Racine manufacturer's line of hydraulic products.

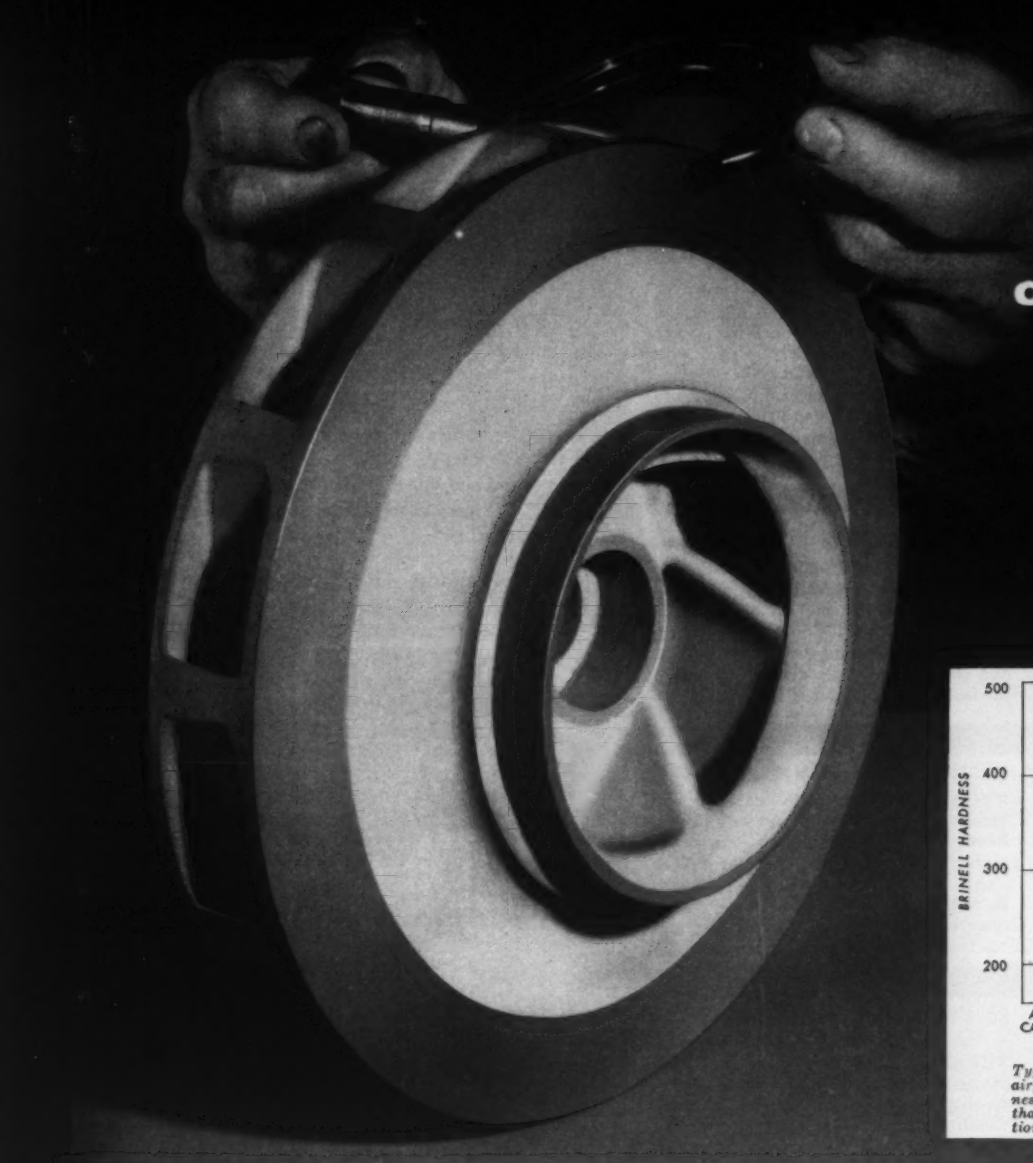
Alcoa Expands at Richmond

Aluminum Co. of America, Pittsburgh, has launched the third major expansion of its Richmond (Ind.) Works in less than three years. The project will include construction of additional facilities for the production of aluminum closures and a modernization of some existing facilities. New equipment will include color coating machinery (for decorating aluminum sheet metal), additional shears, gas lines, and air compressors.

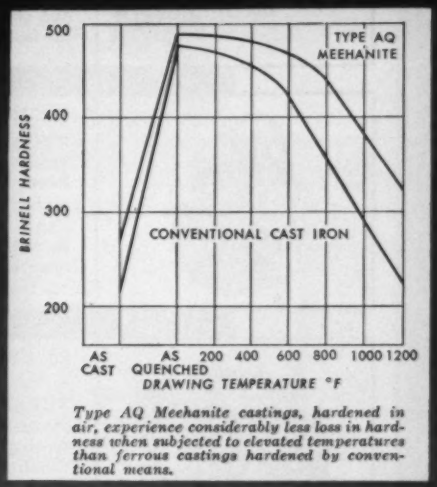
The company also announces that an all-aluminum mine car has been placed in service at a West Virginia mining property. The unit was produced by Irwin-Sensenich Corp., Irwin, Pa.

Alcoa and Aeroprojects Inc., West Chester, Pa., have announced the acquisition by Alcoa of foreign rights to sell and also license the manufacture of Sonobond, ultrasonic, metals joining equipment. The tools manufactured by Sonobond Div., a subsidiary of Aeroprojects, are used to weld, braze, and solder metals by the application of ultrahigh frequency vibrations. Sonobond Div. will supply all machines to Alcoa for sales overseas.

Alcoa also announces that it plans to complete the transfer of all pro-



NOW DIMENSIONAL TOLERANCES CAN BE HELD ON HARDENING



Type AQ Meehanite castings, hardened in air, experience considerably less loss in hardness when subjected to elevated temperatures than ferrous castings hardened by conventional means.

NEW AQ MEEHANITE® . . . keeps distortion to a minimum

AQ Meehanite® is a tough, wear and abrasion resisting material which can be cast to a machinable hardness and air hardened after machining to high Brinell values with little or no distortion, even in massive castings. An outstanding advantage of this new metal is its ability to be locally hardened for improved wear resistance. As no water quenching is required, internal stress is reduced and dimensional tolerances can be held closely. This is particularly important for such parts as dies, punches, cams, rollers, etc.

Type AQ Meehanite is ideally suited for hot forming dies and other parts required to work at elevated temperatures because it maintains its high hardness even when heated. For this reason, AQ Meehanite castings can be expected to provide good wear resistance where conventional flame hardened parts may soften under repeated temperature influence. See chart above. Large castings can be fully hardened . . . simply . . . economically . . . without oil bath equipment . . . and without dangerous distortions.

Free literature is available on AQ Meehanite. Write to the Meehanite Metal Corporation or contact the nearest Meehanite foundry.

You'll like doing business with a Meehanite foundry.

MEEHANITE METAL

The American Laundry Machinery Co., Rochester, N. Y.
Atlas Foundry Co., Detroit, Mich.
Banner Iron Works, St. Louis, Mo.
Barnett Foundry & Machine Co., Irvington, N. J.
Casting Service Corp., LaPorte, Indiana and Bridgman, Michigan
Centrifugally Cast Products Div., The Shenango Furnace Co., Dover, Ohio
Compton Foundry, Compton, Calif.
The Cooper-Bessemer Corp., Mt. Vernon, Ohio and Grove City, Pa.
Crawford & Doherty Foundry Co., Portland, Ore.
Dayton Casting Co., Dayton, Ohio
Empire Foundry Co., Tulsa, Okla.
Florence Pipe Foundry & Machine Co., Florence, N. J.
Fulton Foundry & Machines Co., Inc., Cleveland, Ohio
General Foundry & Mfg., Flint, Mich.
Georgia Iron Works, Augusta, Ga.
Greenlee Foundries, Inc., Chicago, Ill.
Hamilton Foundry Inc., Hamilton, Ohio
Johnstone Foundries, Inc., Grove City, Pa.
Kanawha Manufacturing Co., Charleston, W. Va.
Kennedy Van Saun Mfg. & Eng. Corp., Danville, Pa.
Lincoln Foundry Corp., Los Angeles, Calif.
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Palmyra Foundry Co., Inc., Palmyra, N. J.
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Ross-Meehan Foundries, Chattanooga, Tenn.
Sonith Foundries of FMC, Indianapolis, Ind.
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Vulcan Foundry Co., Oakland, Calif.
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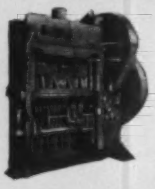
Hartley Foundry Div., London Concrete Machinery Co., Ltd., Brantford, Ontario
Otis Elevator Co., Ltd., Hamilton, Ontario

MEEHANITE METAL CORPORATION, NEW ROCHELLE, NEW YORK

THINK SPEED!

...and you'll think Beatty!

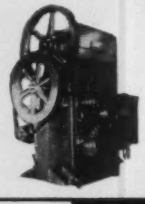


BEATTY GUILLOTINE BEAM PUNCH

"We have estimated our savings at 75 percent with our new No. 9 Guillotine Beam Punch and Spacing Table," says one Beatty user. The Beatty No. 9 Guillotine Beam Punch punches flanges and webs of I-beams from 6 to 30 inches. Large die space; clear working space. 200-ton capacity.

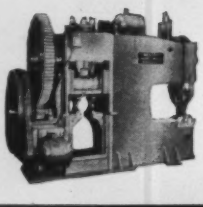
BEATTY SPACING TABLE

Spacing of holes and slots in beams, channels, and plates is precise and automatic with the Beatty Spacing Table. One pass-through completes the job of punching a flange or web-section. Only one operator and one helper are needed to accomplish the task . . . in a matter of seconds!



BEATTY GUILLOTINE BEAM WEB PUNCH

When the objective is to reduce set-up time, the answer may very well be the Beatty Guillotine Beam Web Punch. Offering 200-ton capacity, the Beam Web Punch is arranged for web punching with six sets of gagged tools, decreasing time required for set-up as beam sizes and dimensions change.



NO. 7 DETAIL BEAM PUNCH

is the machine which does the work of THREE, punching I-beams in just three passes instead of the usual five . . . simultaneously eliminating the end-for-end turning of beams. The Beatty No. 7 Detail Beam Punch is of 100-ton capacity, capable of punching up to 1¼ inch hole through 1-inch mild steel.

That's right! Think "Speed" . . . and you'll be thinking in the Beatty language! Or think "Low Costs" . . . and again you'll be thinking in the Beatty tongue! For the Beatty name is synonomous with those of Speed . . . Versatility . . . Efficiency . . . Economy . . . and Accuracy!

Job-engineered to speed work flow and always dependable in performance, the Beatty line is equipped to provide savings of time and cost . . . in a host of metalworking areas.

So, if you've been thinking in terms of greater speed and lower costs (and who hasn't?), now is the time to start speaking the Beatty language.

Yours for the asking: Complete literature on the products of Beatty and Beatty Quickwork is available on request. Why not write . . . right now?

BEATTY

MACHINE & MANUFACTURING COMPANY

913 150th St., Hammond, Indiana

duction from its chemical works in East St. Louis, Ill., to facilities at other plants at Bauxite, Ark., and Point Comfort, Tex.

ASSOCIATIONS

Welded Steel Tube Institute, Cleveland, is the new name of Formed Steel Tube Institute. Jehu R. Derrickson is executive secretary-treasurer.

American Die Casting Institute Inc., New York, re-elected these officers: President, G. C. Curry, Dollin Corp., Irvington, N. J.; vice president, W. E. Brown, Kiowa Corp., Marshalltown, Iowa; and secretary, David Laine.

NEW ADDRESSES

Crucible Steel Co. of America moved its central offices to 4 Gateway Center, Pittsburgh, Pa. The offices were in four separate buildings in downtown Pittsburgh.

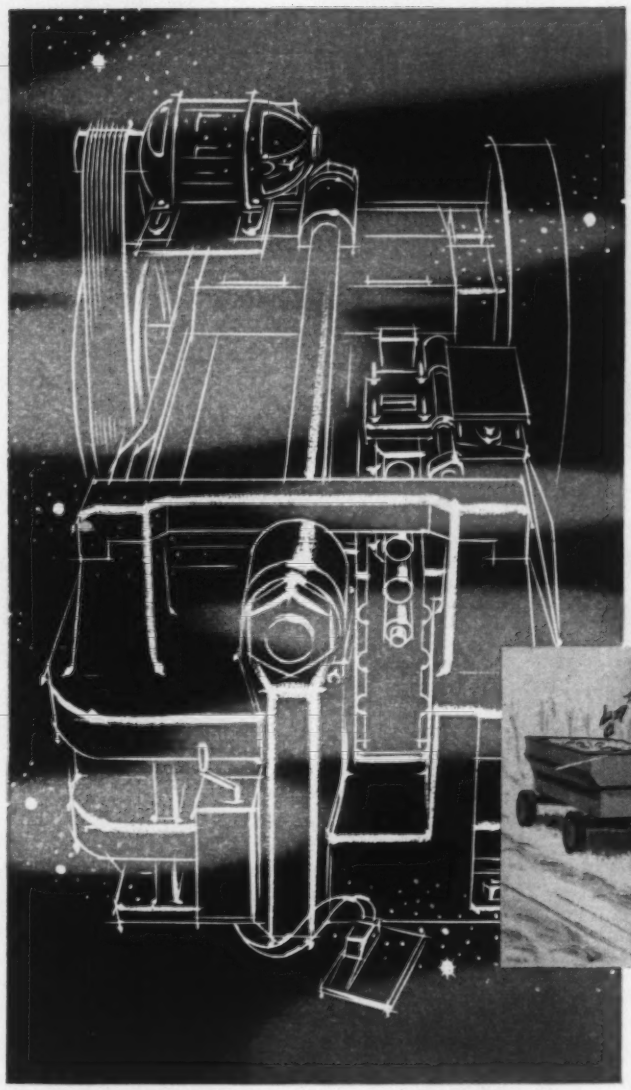
Advertising Dept., Haynes Stellite Co., moved to the new Union Carbide Bldg., 270 Park Ave., New York 17, N. Y.

Blumberg Supply Corp. changed its name to Alisco Co., a division of Allmetal Screw Products Co. Inc. The firm moved to 809 Stewart Ave., Garden City, N. Y.

Lauder Brass Ltd. moved to a 6000 sq ft building at 111 Toryork Rd., Toronto, Ont. The firm is doubling its manufacturing space. It custom finishes brass, aluminum, and steel castings, and produces machined parts on a contract basis.

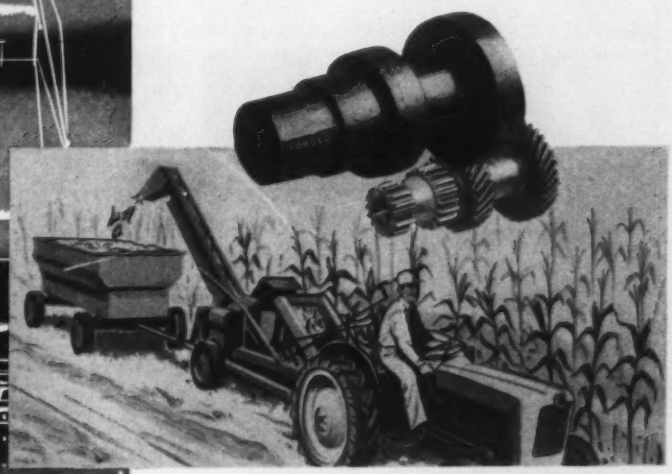
HRB-Singer Inc., a subsidiary of Singer Mfg. Co., New York, moved its Brunswick, N. J., branch office to 475 Watchung Ave., North Plainfield, N. J.

Acorn Sheet Metal Mfg. Co. Inc. will consolidate all manufacturing facilities in a new building at 3750 N. Powell Ave., Franklin Park, Ill. The new facilities will be ready by Dec. 15. The plant will be equipped with shearing facilities, punch press,



Upsetter, or horizontal forging machine

RESISTANCE TO PUNISHMENT of any severe-service part increased by designing it to be forged



Gear blanks for tractor and farm implement transmissions are designed to be upset-forged, usually with integral forged stub shafts. Forging gives these vital parts maximum resistance to gear-clashing shifts. Transmission life can be equal to equipment life when gears are FORGED.

When you *design with forgings* right from the start, you take full advantage of the many benefits which only forgings offer: highest ratio of strength to weight . . . highest resistance to impact, shock, vibration, torsion . . . preferential orientation of flow lines in the forging to concentrate strength where required . . . absence of wasteful inclusions and voids.

Forged parts start out as *better* metal . . . are made *even better* by the hammer blows or pressures of the forging process. Write for literature to help you design, specify, and procure forged parts.

When it's a vital part, design it to be FORGED

Drop Forging Association • Cleveland 13, Ohio

Names of sponsoring companies on request to this magazine

CM METEOR Electric Wire Rope Hoist

½ to 5 ton capacities—Compact, enclosed design. Low headroom. Continuous hoist-duty motor with thermal overload protection for heavy duty service. Precision bearings and helical gears for long life. Only 110 volts at push button control.

CM HOISTS

FOR { REPETITIVE PRODUCTION APPLICATIONS OR RUGGED MAINTENANCE WORK

HAND or ELECTRIC—CHAIN or WIRE ROPE

CM makes them all! So you can choose a hoist that's perfectly suited to your own needs in a safe, highly efficient CM design. Three of the most popular models are illustrated. Specifications of other types and sizes on request.

CM LODESTAR Electric Chain Hoist

⅛ to 1 ton capacities—First truly heavy duty version of small electric hoist. ¼ ton model weighs only 51 lbs. Heavy duty self-adjusting mechanical brake and regenerative electrical braking. Overload protection and upper-lower safety switches. CM-Alloy load chain.

CM CYCLONE Hand Chain Hoist

¼ to 10 ton capacities—Easy to carry and lift. One ton model weighs only 36 pounds. Made of tough aluminum alloy. CM-Alloy load chain. High efficiency. Lifetime lubrication.

ALSO CM Pullers, Trolleys and Cranes

CALL the CM distributor for catalog, prices and fast delivery from stock.

CM HOISTS AND CHAIN

CHISHOLM-MOORE HOIST DIVISION

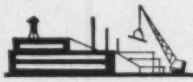
COLUMBUS McKINNON CHAIN CORPORATION

TONAWANDA, NEW YORK

REGIONAL OFFICES: NEW YORK, CHICAGO, CLEVELAND

In Canada: McKINNON COLUMBUS CHAIN LIMITED, ST. CATHARINES, ONTARIO

press brake, and for all phases of welding and finishing. The plant will also house the activities of Acorn Products Co., a subsidiary marketing metal stationery products.



NEW PLANTS

Indiana Cap & Set Screw Co., Franklin Park, Ill., opened a 15,000 sq ft warehouse at 2654 Kenzie Terrace, Milwaukee, Wis. The firm makes and distributes fasteners. The warehouse is managed by Ron Herrick.

Walker Mfg. Co., Racine, Wis., will build a $1.5 million plant at Harrisonburg, Va. The company makes oil filters, exhaust systems, and other automotive accessories.

CONSOLIDATIONS

Harvestore Div., A. O. Smith Corp., Kankakee, Ill., purchased **Ranger Inc.**, Delphi, Ind., producer of farm equipment.

Hupp Corp., Cleveland, acquired **Gemco Inc.**, Los Angeles, pioneer in the field of ejection and separation systems. Officers of Hupp's new subsidiary include: President, J. J. Lane; and vice president, F. J. Head.

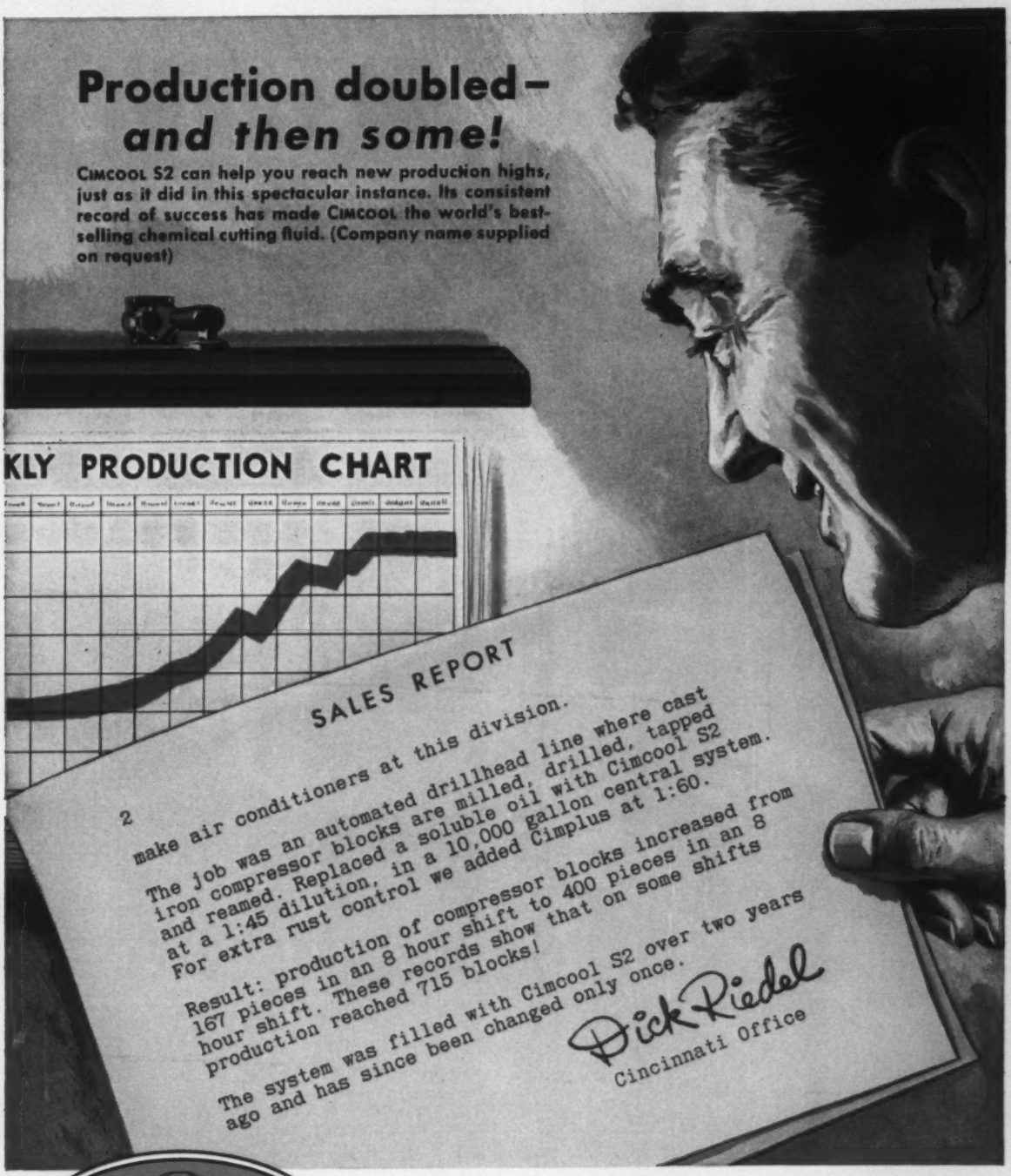
Prairie Western Wire & Cable Co., Weyburn, Sask., and **Canada Wire & Cable Co.**, Toronto, Ont., will merge Oct. 1. The merger is expected to double the output of the $1 million plant at Weyburn within three years.

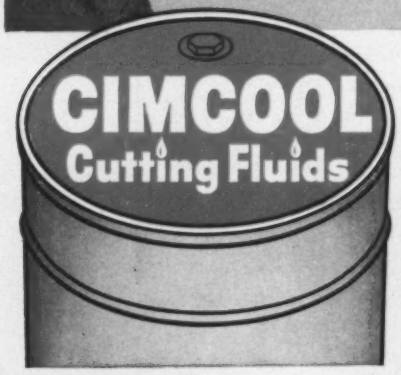
Magnetics Inc., Butler, Pa., purchased **Kemco Corp.**, Sandy Lake, Pa. Magnetics produces electronic components; Kemco, industrial control panels. L. N. Martin will continue as president of the subsidiary.

Allis-Chalmers Mfg. Co., Milwaukee, purchased controlling interest in **Etablissements de Constructions Mecaniques de Vendeuvre S. A.** The French firm makes air cooled, diesel farm tractors; industrial engines; and engine-generator sets.

Production doubled— *and then some!*

CIMCOOL S2 can help you reach new production highs, just as it did in this spectacular instance. Its consistent record of success has made CIMCOOL the world's best-selling chemical cutting fluid. (Company name supplied on request)


KLY PRODUCTION CHART
SALES REPORT
2
make air conditioners at this division.
The job was an automated drillhead line where cast iron compressor blocks are milled, drilled, tapped and reamed. Replaced a soluble oil with Cimcool S2 at a 1:45 dilution, in a 10,000 gallon central system. For extra rust control we added Cimplus at 1:60.
Result: production of compressor blocks increased from 167 pieces in an 8 hour shift to 400 pieces in an 8 hour shift. These records show that on some shifts production reached 715 blocks!
The system was filled with Cimcool S2 over two years ago and has since been changed only once.
Dick Riedel
Cincinnati Office



FOR 100% OF ALL METAL CUTTING JOBS

Production-proved products of The Cincinnati Milling Machine Co.

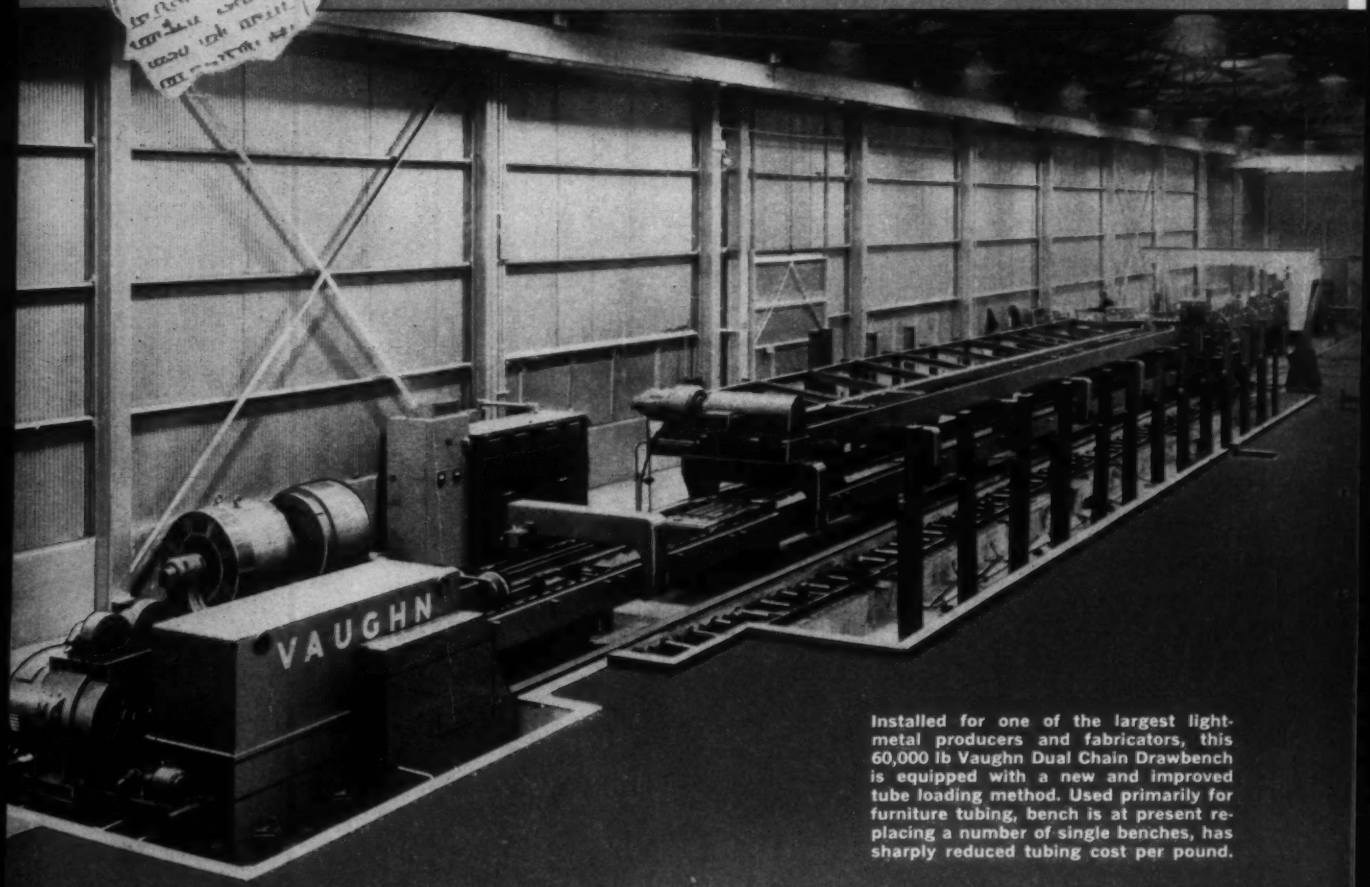
CIMCOOL S2 Concentrate — The pink fluid which covers 85% of all metal cutting jobs.
CIMPERIAL° — Newest in the famous, industry-proven line of CIMCOOL° Cutting Fluids.
CIMPLUS — The transparent grinding fluid which provides exceptional rust control.
CIMCUT Concentrates (AA, NC, SS) — For every job requiring an oil-base cutting fluid.
ALSO — CIMCOOL Tapping Compound — CIMCOOL Bactericide — CIMCOOL Machine Cleaner.

For full information on the complete family of CIMCOOL Cutting Fluids, call your CIMCOOL Distributor. Or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

°Trade Marks Reg. U. S. Pat. Off.

In the NEWS

Vaughn®



Installed for one of the largest light-metal producers and fabricators, this 60,000 lb Vaughn Dual Chain Drawbench is equipped with a new and improved tube loading method. Used primarily for furniture tubing, bench is at present replacing a number of single benches, has sharply reduced tubing cost per pound.

Air-operated carriage and skid arm, equipped with push-off, on Bench shown at left. Carriage has shock absorbers for each bar operating independently.

This Vaughn Bench pulls 60,000 pounds for an Illinois steel and wire producer. Bench points and draws three — 1¼" bars simultaneously.

Drawbenches

•NEW DESIGNS •HIGHER SPEEDS

•Finer Cold Drawn Production!

Vaughn Machinery Company—builders of the world's most complete line of cold drawing equipment—is proud to present advanced new Drawbench models for tubes, bars, and shapes.

Available in double and single chain types, these latest Vaughn Benches employ totally new loading concepts that permit drawing five tubes at a time *and more.*

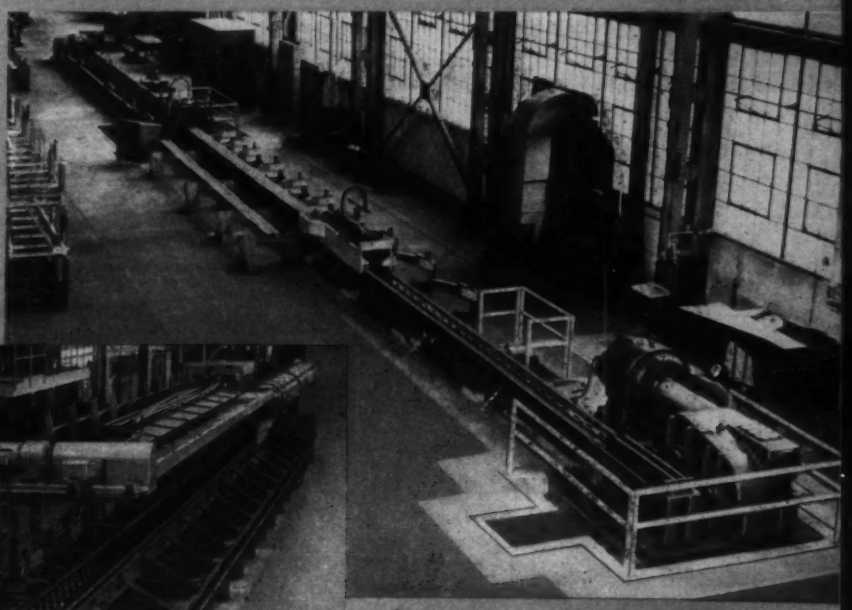
Vaughn dual chain benches now in operation are drawing tubing up to 550 fpm—straighter tubing! In fact, generally higher speeds are now feasible with a new chain design which permits high speeds without lubrication problems.

New "floating" foundation design reduces installation and foundation maintenance costs. Many additional refinements contribute to Vaughn leadership in modern drawbench performance. Consult your Vaughn engineer on your cold drawing problems.

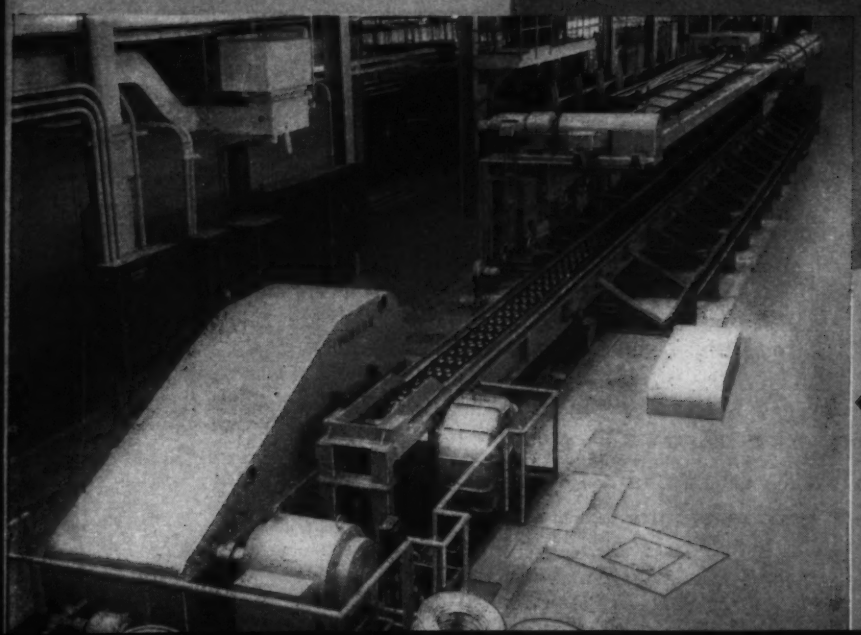
The Vaughn Machinery Company, Cuyahoga Falls, Ohio, U.S.A.

If it's Cold Drawn see **Vaughn**

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.



For another Illinois producer, this Vaughn Drawbench is equipped for bars, tubes and shapes. It is used primarily for shaving magnesium on a production basis.



Installed at a large Canadian tubing producer, this Vaughn Drawbench includes roll-over mandrel and, carriage tube shock unit and air clutch. Canada's largest-ever order for copper tubing was recently drawn by this bench.

M&T Chromate Finish on zinc plate helps supplant costlier materials

Consider the needs of a familiar wire product . . . a refrigerator shelf. It needs to resist corrosion, must be strong, relatively inexpensive. Significantly, you'll find that many a top quality unit utilizes shelves made from ordinary steel which is zinc plated, chromate treated, and then topped off with a baked, clear enamel.

Such a finishing system, with Unichrome* Chromate Dip and Unichrome Clear Enamel, has been in use for almost 15 years. Good reason. It cuts costs, yet gives quality unmatched even by more costly materials.

You can do the same for your wire product or other zinc plated parts. Use Unichrome Dip in chromium-like clear or lustrous metallic red, green, blue or gold to dress up the zinc plate, "beef up" its corrosion resistance. The added eye appeal you see at a glance. The extra protection has tested out to be one of the highest among dyed chromate finishes.

All Unichrome Dips in the wide M&T line react chemically with the zinc surface, render it passive, prime it for organic finishes.

Typical cost of material for a Unichrome Dip Finish comes to just a fraction of a cent per square foot of surface treated. A new Unichrome Pick-a-Dip Chart gives details on finishes available. Write for your copy.

*M&T's registered trademark

M&T **plating products** · welding products
coatings · metals · chemicals

METAL & THERMIT CORPORATION, General Offices: Rahway, New Jersey

Technical Outlook

ADHESIVE FIGHTS HEAT— Metal panels laminated to honeycomb with a glass bond and air setting adhesives will withstand 1000° F at several thousand psi for many hours, claims Prof. D. G. Bennett, Ceramic Engineering Department, University of Illinois, Champaign, Ill. He says progress is being made on adhesive which will be effective at 2000° F.

NEW ENTRY IN CONTROLS— Cincinnati Milling Machine Co., Cincinnati, has formed a Cimtrol Div. to market its new numerical control and tracing and gaging systems. The new division will also supply programing services for users of Acramatic numerical control.

AUTOMATIC FORGING— Some sources believe European and British shops are much farther ahead than ours in automation. A British firm, for example, is working with taped programing for an automated forging setup.

FORMING ON THE INSIDE— Chrysler Corp. has installed two Intraform machines at its Indianapolis electrical plant. The firm is using the machines, built by Cincinnati Milling Machine Co., Cincinnati, to form spline and cam shapes inside starter clutch housings. Rate per machine: 270 parts an hour. The new units replaced five other machines.

AIDS TITANIUM WELDING— A vanadium interlayer improves strength and corrosion resistance of welds between titanium and steel, claims Titanium Metals Corp. of America, New York. Either plugs or a thin, continuous sheet are adequate.

CITE OXYGEN DATA— At the AISE Convention in Cleveland, an English firm detailed its experience in turning out 1 million tons of steel in a converted, 300 ton tilting furnace. It claims that a ton of steel requires 1270 cu ft of oxygen, 820,000 Btu of fuel, and much less refractory than a comparable open hearth. Production is 50 per cent higher than that of an all-basic furnace and double that of an older silica furnace. The charge is molten iron from an active mixer. Phosphorous content runs 1.0 to 1.25 per cent.

MOVE TO QUIETER BEARINGS— Nuclear powered submarines need quiet roller bearings to escape sonar detection. Electronic test equipment of six bearing makers that supply the Navy will be standardized by SKF Industries Inc., Philadelphia, states Thomas W. Morrison, director of engineering. Benefit: It eliminates lot sampling at the Navy's engineering experiment station.

POLLUTION CHECK— Chemical wastes can be traced more quickly and easily by adding lithium nitrate to an effluent sample, cooking until dry, then burning the solids in a spectrograph. "Lab technicians can cover more ground by reading the film from the spectrograph," claims Truck & Coach Div., General Motors Corp., Pontiac, Mich.

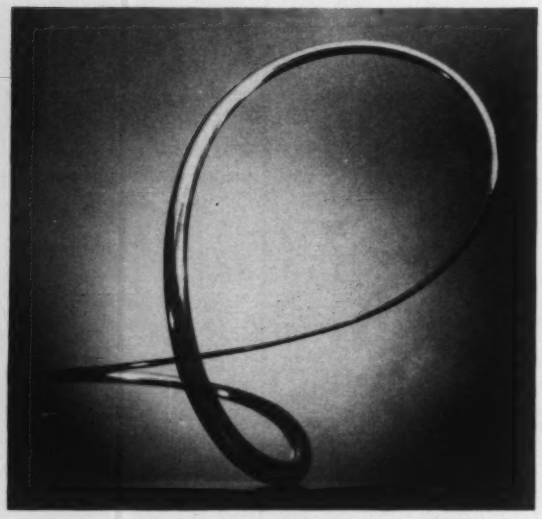
WASTE AIDS ORE REFINING— Spent sulfite liquor, a long time disposal problem to papermakers, may find application as a binder in preparing low grade iron ore for shipment. Michigan College of Mining & Technology, Houghton, Mich., is doing experiments which may lead to the elimination of baking operations in concentration plants.

COATINGS RESIST HEAT— Nickel-aluminum alloys applied over steel, nickel, molybdenum, and other metals adequately protect surfaces from oxidation at temperatures of 1800° F, says the National Bureau of Standards, Washington. It developed plating methods for Wright Air Development Center, Dayton, Ohio.

BOON FOR REINFORCING BARS— More efficient ways of employing higher strength reinforcing in concrete beams may result in economies in the use of steel, reveals the American Iron & Steel Institute, New York. Studies by the National Bureau of Standards, Washington, indicate that codes could be revised to permit designers to take advantage of beam strengths up to 100,000 psi compared with current limits of 20,000 psi.

U.S. Steel Launches Design Program

Aim is to create additional markets for steel by showing how it can be used



U. S. STEEL CORP. has added a new dimension to marketing: It's supplying customers with end use ideas that suggest how they can tap the vast potential of the 10,000 steels available today.

The corporation's latest selling-in-depth project, officially called "A Study in Steel," was launched in New York last week. Manufacturers were shown hand-built prototypes of new designs in steel office furniture, plus sports and play equipment.

In time, many more end product designs will be developed. Currently, new applications in equipment, machinery, and building construction are being explored.

"Knowing that our customer's loyalty is to his markets, we feel that an objective analysis of the potential of steel in end uses must be made by us," says U. S. Steel market developers.

The corporation enlisted the services of Peter Muller-Munk Associates, a Pittsburgh industrial design firm, to help it unlock steel's "personality" and present it as a dynamic design material.

Engineering principles were studied in steel at work in buildings, bridges, crane booms, bicycle wheels, fire escapes, and in many other applications. Then the principles were translated into designs that demonstrate new ways steel can be used in end products and how it can do a better job than competing materials.

The premise: Show people how they can use steel, and they'll use more of it.

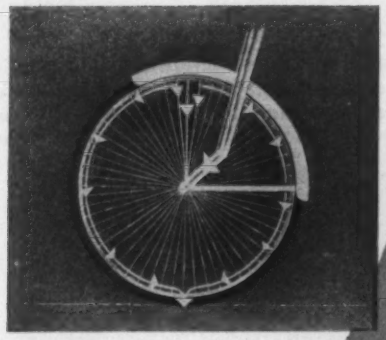
Highlights of the "show them" program are presented in this and the next three pages.

Tension

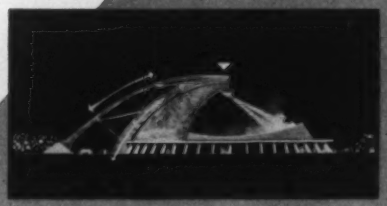
Compression

Cantilever Action

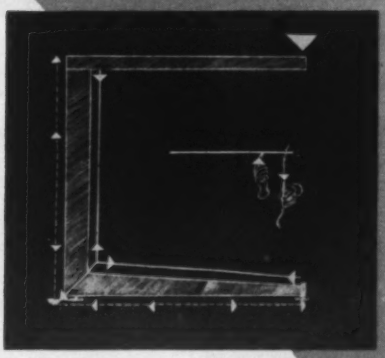
The above mechanical principles govern structural efficiency, the U.S. Steel study emphasizes



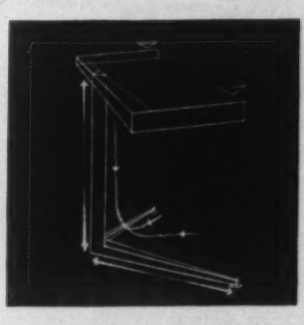
The bicycle wheel is an outstanding example of tension and compression. The weight of the load is suspended (indicated by arrows) from three or four slim strands of wire, placing them under tension. The workload is passed from the axle, through three or four spokes at the top of the wheel and into the rim. The rim is placed under compression as the load is carried around and down to the ground



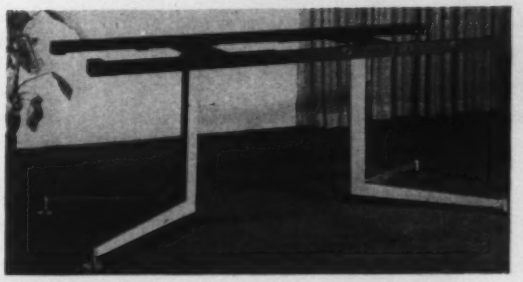
Cantilever action is demonstrated by this sketch of Pittsburgh's new Civic Arena. The top member, which is under tension, and the bottom member, which is under compression, are combined to obtain a cantilever effect that will support tremendous weight



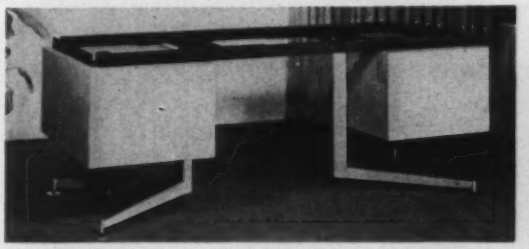
The three principles—tension, compression, and cantilever action—were applied to a basic support unit, a "C" leg, which can be used in a variety of ways to support many different loads, as indicated by the arrows



A variation of the "C" leg is the "V" leg. Both use the same mechanical principles



By using two basic legs and connecting members, a freestanding, load bearing frame is produced



Addition of these drawer units puts the frame to work. The boxes are hung from the frame and require no additional support. They are a box within a box, the two being separated by urethane foam plastic under pressure

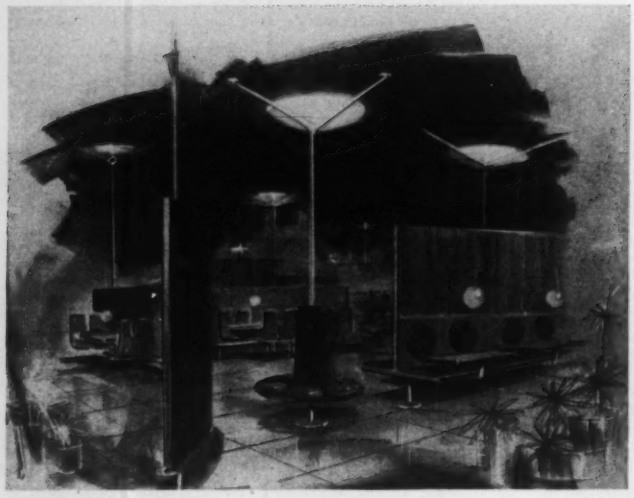
Next elements to be added are the modesty panels and the top. The panels, made of stainless steel, go through a simple punching operation that produces the design. The oiled wood top laminated to the steel gives the finished job a quality appearance with the nonwarp characteristics of steel

(*Please turn to Page* 108)

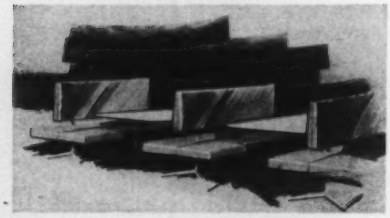
This executive chair is made of vinyl coated sheet steel wrapped in a structural form. It derives its strength from its own shape. The legs—five of them for nondirectional stability—are slight variations of the "C" leg. The principles at work are: Compression along the top of the extended leg surface; tension along the bottom

The transition from furniture to the area of public activities was a natural step in the search for design opportunities. The three mechanical principles were applied to:

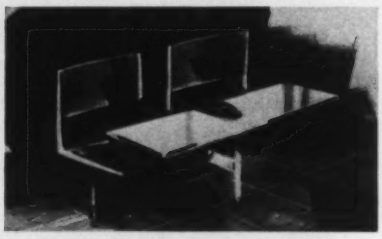
. . . store arrangements



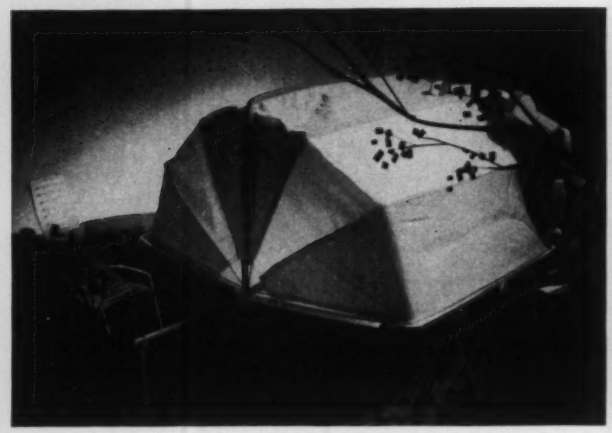
. . . restaurant booths



school seating . . .

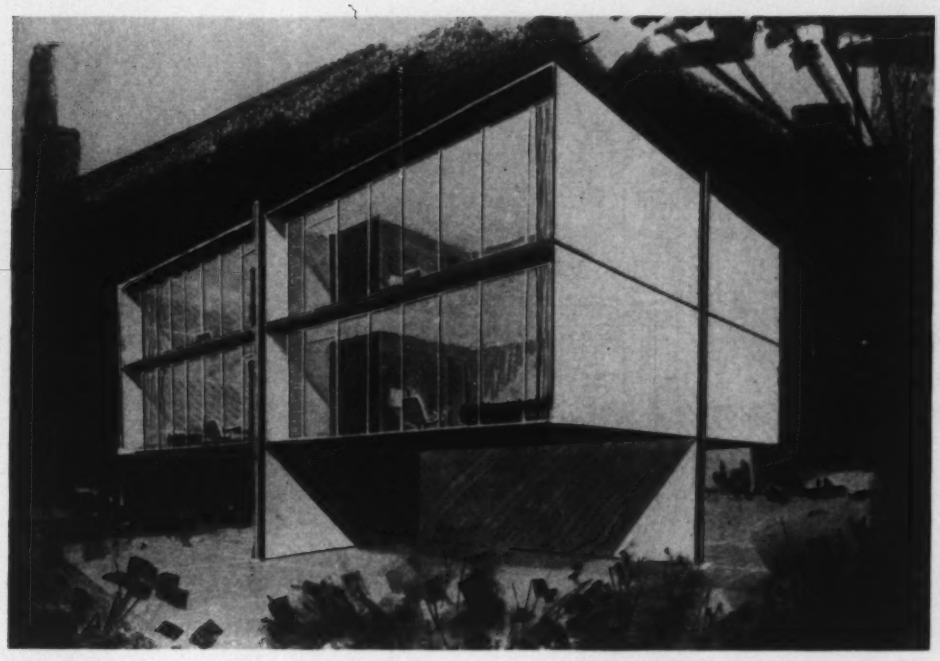


. . . portable shelter



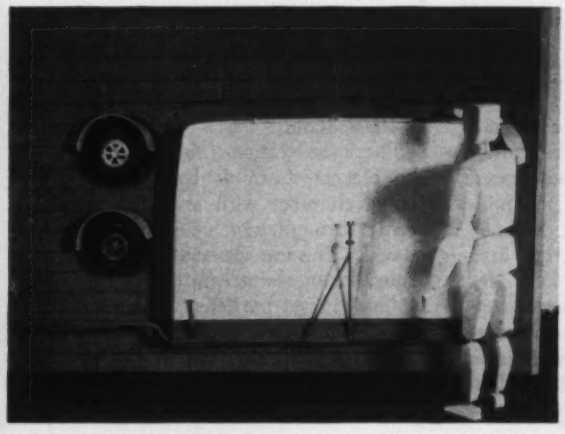
. . . that folds for hauling . . .

. . . motel

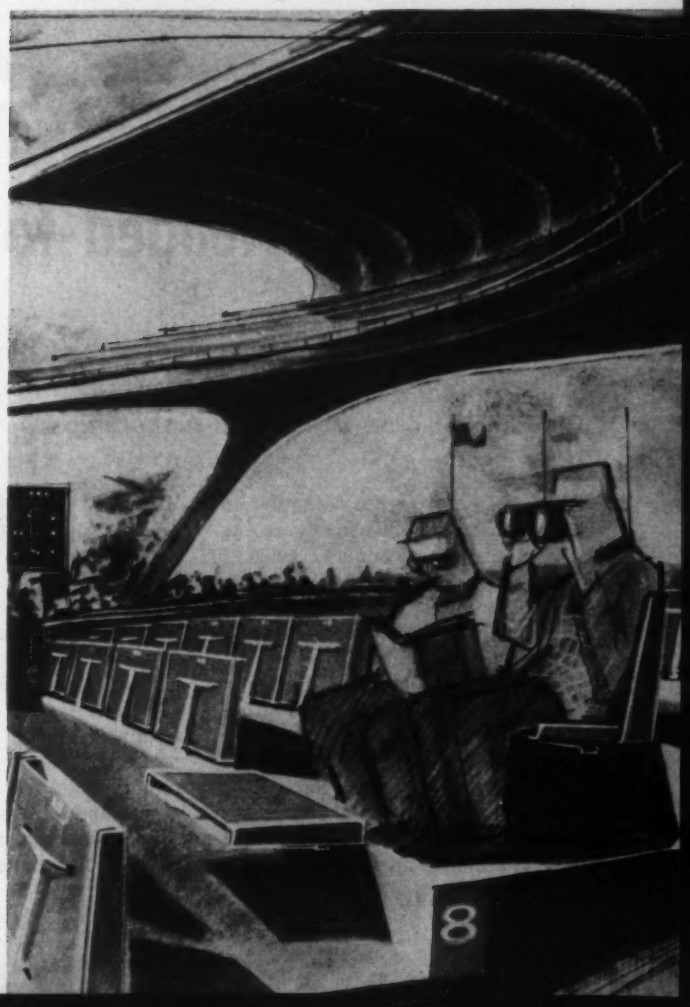


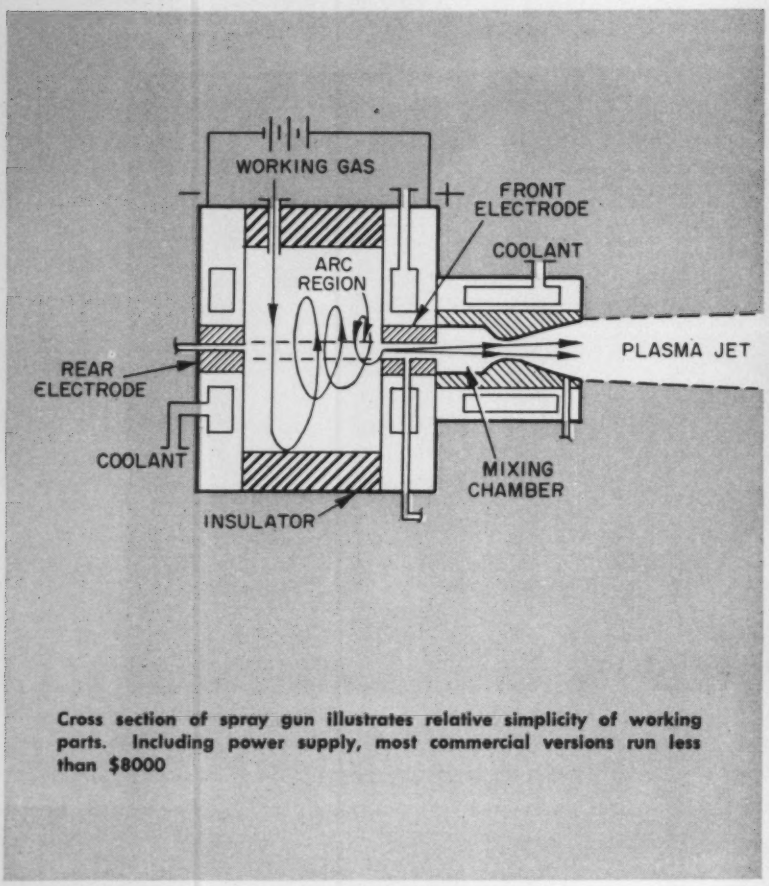
. . . playground

and comes apart for storage



stadium seating





Cross section of spray gun illustrates relative simplicity of working parts. Including power supply, most commercial versions run less than $8000

Plasmajets Headed for Production Roles

Fantastic temperatures generated by this new device can melt or vaporize anything. Biggest metalworking promise: Cladding of base metals, self-supporting shapes

STREAMS of superheated gases are opening new realms for metalworking pioneers to conquer, believes Ben Lohrie, Plasmakote Corp., Culver City, Calif.

Plasmajets, which generate some 35,000° F, are already practical for depositing refractory metals or ceramic materials on various structures with superior fidelity and density.

Mr. Lohrie suggests two other areas may prove to be even more important: Cladding of large size sheets; building up metal structures on cheap, disposable forms.

Other advantages listed by Mr. Lohrie include:

1. Higher temperatures permit operators to spray a tremendous range of materials. In most cases, temperatures even exceed the boiling point of the materials.

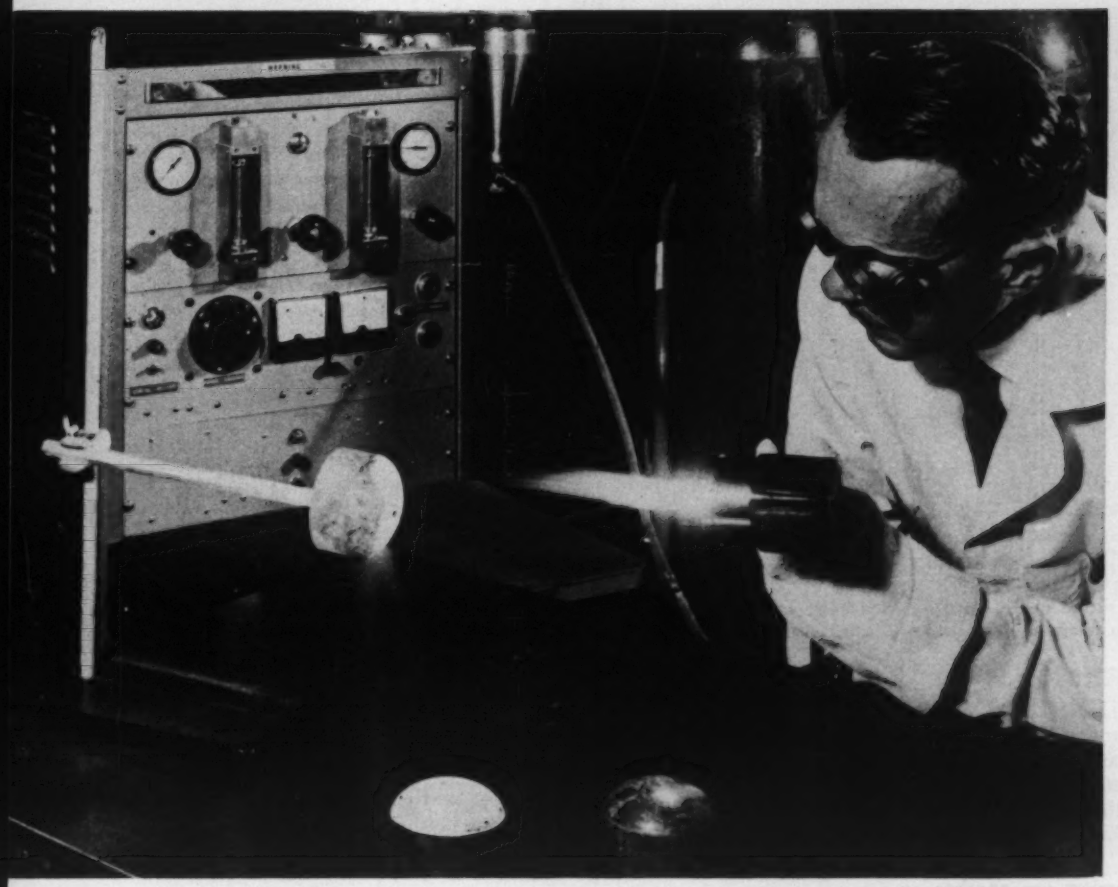
2. The system can operate in a completely inert atmosphere for protection from atmospheric contamination. You have a choice of argon and arc, argon and pusher gas, or a complete argon shroud. A dry box technique permits close to 100 per cent inert atmosphere.

3. Deposits are much denser than coatings laid down by older methods. Reason: Plasmajet velocities are much higher.

• Plasmajet equipment is comparatively simple. Six application categories have proved successful so far at Plasmakote.

The cross section (above) shows the plasma gun. It has a water cooled chamber with an arc in its center through which an inert gas passes. The arc dissociates the gas molecules into a stream of extremely hot, ionized particles. Temperature is high enough to melt or vaporize anything, states Mr. Lohrie.

The result: Plasmajet deposits



Operator deposits an oxide on an experimental nose cone. Example below is beryllium overlaid with tungsten which cannot be pried or spalled away from base material

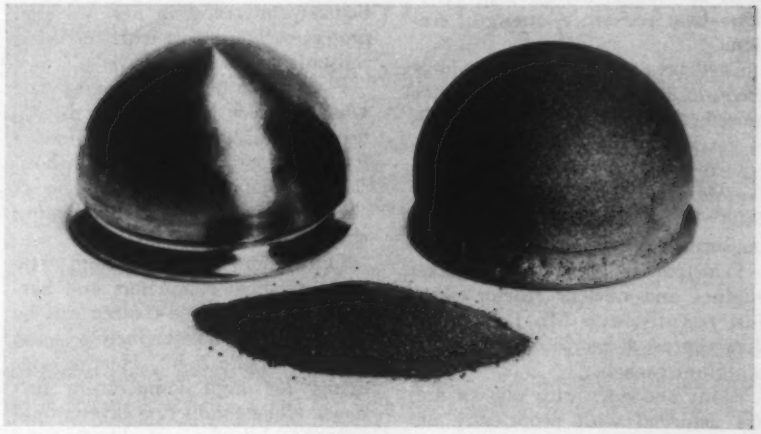
are different from spray coatings. Higher temperatures permit constituents, which react with each other and with the base material, to form a brand new materials system.

Such depositions fall easily into six categories: 1. Heat barriers. 2. Erosion barriers. 3. Corrosion barriers. 4. Nuclear barriers. 5. Electrical conductors or barriers. 6. Self-supporting shapes.

• Plasmakote people are gaining much experience in forming heat barriers.

Thermal shock frequently cracks or spalls overlays, like those on ceramic coated metal rocket motors.

Mr. Lohrie is putting oxide coatings on metals which defy shocks. STEEL editors examined a titanium sheet (about 0.050 in. thick) which was coated on one side with a ceramic. After it had been heated to a white glow, it was plunged quickly into water. No spalling occurred.



Such a test gives an insight into what happens in a rocket motor. During pad preparation, the metal-ceramic is cooled to a minus 300 or 400° F by the liquid fuels. Firing

Pure tungsten rocket nozzle (left) was built up on mandrel at center. Wrapped in an ultrahigh temperature resistant plastic, it's ready to go to work

suddenly changes that to a plus 7000° F. Plasmakote says several of its coatings have resisted cracking and spalling in such applications.

• Erosion barriers are another approach to the heat problem: An erosion resistant material is deposited on a high temperature, soft oxide, or complex, sandwiches (combining several materials) can be built up. Each handles one function—heat resistance, strength, erosion.

Carbides are the most widely used erosion barriers. Usually, they must be mixed with other materials to get top rate results. Plasmakote reports it has had good results with tantalum carbides which melt at 7100° F. Maximum buildups so far have not exceeded 1 in.

Principal applications: Rocket engines and nuclear reactor parts. Just recently, says Mr. Lohrie, the firm coated a beryllium tube with tantalum carbide.

Many successes with plasma arcs are achieved with proprietary devices. They permit the lining of any tube, any diameter, any length.

Here are some examples:

• Beryllium tubes coated with tantalum carbide.

• Tantalum carbide tubes 1/16 in. in diameter, 6 ft long, with walls only 0.006 in. thick.

• Graphite tubes, ¼ in. in diameter, 6 ft long, lined with tantalum carbide.

• Hydraulic cylinders lined with a highly wear resistant metal.

• Steel tubes lined with stainless for corrosion resistance.

• Steel plate cladding shows great promise. Nuclear people are particularly interested in new ways to protect carbon steels with corrosion resistant metals and alloys.

Plasmakote is doing some of that type of work for several private firms. Mr. Lohrie's prediction: Plasma deposits of stainless on both sides of plates will one day be as cheap as present methods of coating only one side.

Only limited work has been done with electrical conductors and barriers. A conductive coating can be laid over a nonconductive base. Possible application: Heating elements for high temperature furnaces. The conducting layer would heat up while the underlayer would insulate. Thermocouples are another example.

• The greatest achievements will be in building up self-supporting shapes, believes Mr. Lohrie.

Plasmajet techniques should interest many metalworking people who build systems with a combination of properties, he says.

A material is deposited on a shaped mandrel. The shape is retrieved by removing the mandrel (sometimes chemically). A postspray closes any pores and increases strength.

Suppose you built up a shape which has 25 per cent the strength of mill stock. Postspraying could increase its strength to about 75 per cent. Current efforts to improve that technique promise results up to 85 per cent.

The method also eliminates joining and machining.

• Plasmakote suggests a number of applications of plasmajet techniques.

• Reciprocating or rotary shafts operating in abrasive hot environments can be coated with a high temperature metal. Shafts with a 98 per cent dense deposit of molybdenum might work well in an oil well. In reacting with the corrosive environment, the coating may produce some molybdenum disulfide, a good lubricant.

• Magnesium castings or forgings coated with corrosion and heat resistant materials would greatly extend useful applications.

• Electric motor windings (wire or tape) could be insulated more effectively to withstand high temperatures, reduce bulkiness.

• Metal lined plastics combine strength, ductility, and temperature resistance. You begin by making a self-supporting metal shape, backing it with a strong second metal and encasing the whole thing in plastic.

• Some research indicates the plasmajet may be a way to refine metal directly from ore. Gold ore, for example, can be powdered, passed through the jet. Result: Pure gold.

• The jet is also being used to make large quantities of ammonia at high speed. Other chemical applications are being developed

• If you'd like to have a copy of this article, write to Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio. You may win $1000 by using material like this in STEEL. For details, see the Servicenter, Pages 5 and 6.

● IN LOWER PRODUCTION COST

● IN HIGHER RATE OF PRODUCTION

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DREVER WIDE PLATE HEAT TREATING LINE

One man in the control booth (just beyond the high framing of the pressure quench), by "pushbutton" control and television monitoring, operates this 550′ long Drever Wide Plate Heat Treating Line. It processes alloy or carbon steel plate up to 172″ wide by 3″ thick and 600″ long through hardening furnace, pressure quench and tempering furnace. Close control of each stage assures high, uniform quality—and the 21½ ton per hour capacity provides high, economical production.

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Designing and installing a line like this involves a wide range of knowledge. This knowledge can be used to provide the answer to your particular furnace or heat treating requirements in equipment as large as this—or much, much smaller. Write or phone us. Drever Company, Bethayres, Pa. Phone WI 7-3400

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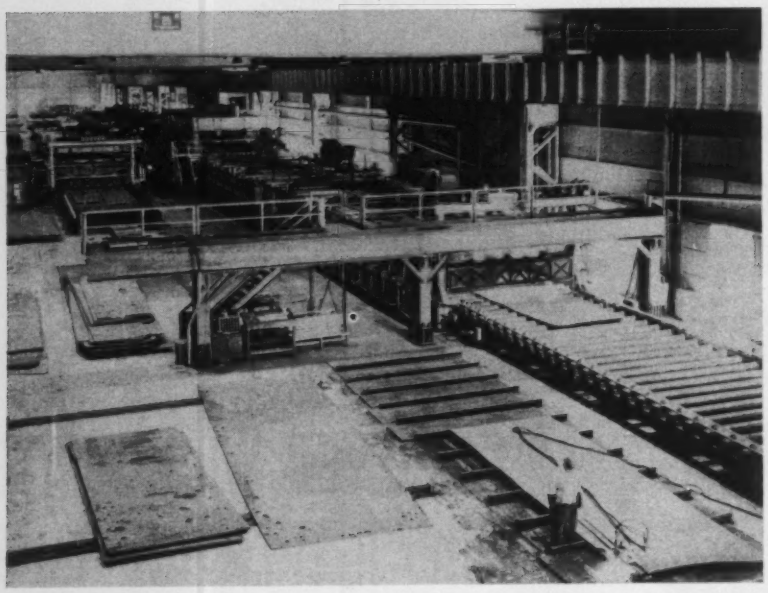
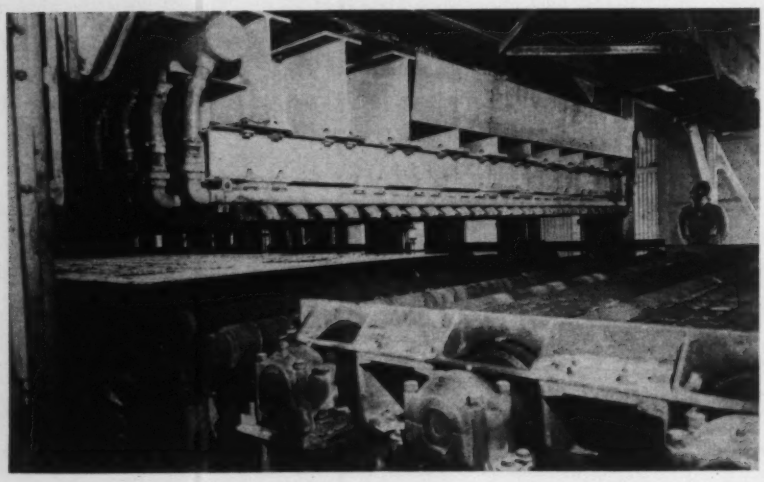
Improved Processing Line Increases Plate Output

More flexible handling equipment and improved combustion design permit the system to outproduce a similar line installed earlier at the same plant





Steel plate rolls into one of the hardening furnaces (above) at United States Steel's Homestead Works. Platen being lowered in the water quench system (below) applies pressure to plates, keeps them from warping during rapid cooling

CAPACITY to produce "T-1" steel and armor plate has been increased at the Homestead (Pa.) Works, United States Steel Corp., by an additional plate heat treating line.

The new line, designed and constructed by Drever Co., Bethayres, Pa., is expected to turn out more material per hour than the Drever line installed previously at the plant because of its improved combustion design and more flexible plate handling equipment.

• One operator handles the processing line, using pushbutton controls and a television monitoring system.

The line, built to process carbon and alloy steel plates up to 45 ft long, 156 in. wide, and 2 in. thick, includes a hardening furnace, a tempering furnace, and a pressure quench.

The hardening furnace has a maximum temperature rating of 1750° F. It is about 18 ft wide and 142 ft long. Average hearth load: About 18 tons an hour.

The tempering furnace, also 18 ft wide, is 160 ft long. It provides a maximum temperature of 1350° F, and will process about 22 tons of plates per hour.

• Quenching sprays cool the plates while pressure platens prevent warping.

When plates are positioned in the quench, conveyor rollers are depressed so the steel rests on a fixed platen. Then the top platen is lowered onto the top of the plate.

Ribbed surfaces of both platens extend across the quench; water pipes are mounted in recesses between the platens. Quench water is sprayed on the plate from above and below, at 21,000 gallons per minute, while the top platen distributes a 100 ton pressure uniformly over the plate surface. That minimizes warping of the steel when it is cooled suddenly.

• Other continuous plate processing facilities were installed earlier.

Plate heat treating equipment, installed at the plant in 1957, included a hardening furnace, tempering furnace, quench, and a furnace for annealing stainless steel plates. The quench, situated in the center of the system, permitted heat treating and quenching of stainless grades, or hardening, quenching, and tempering of alloy steels and armor plates.

METALGRAMS

UNION CARBIDE METALS

. . . news of "Electromet" ferroalloys and metals

Electromet brand ferroalloys, pure metals and metal chemicals

SEPTEMBER 1960

MORE ELECTROLYTIC MANGANESE -- To meet the increasing demand for "Elmang" electrolytic manganese metal, Union Carbide Metals has expanded its cell capacity by 20 per cent. Hence, a larger supply of this high-purity product (99.9 per cent minimum manganese) is assured for additions to steel, copper, and aluminum. Also of interest: (1) The metal is now available in 50-lb. bags for convenient, accurate additions. (2) The 600-lb. drums of "Elmang" manganese are now color-coded to allow easy identification of the regular, dehydrogenated, and nitrogen-bearing grades. Write for new specification sheet, F-20,151.

* * *

ALLOYS FOR BASIC-OXYGEN STEELMAKING -- Interest has been focused on the basic-oxygen process because it can make high-quality steel rapidly and at low cost. Small accurate alloy additions can be made to the ladle of basic-oxygen heats with bagged alloys. Where large chromium and manganese additions are required, "Chromtemp" ferrochrome and "Mantemp" ferromanganese can be added to the ladle. All these unit-weight packages allow precise analysis control. Also, furnace time is not required to dissolve the alloys in steel. Your UCM representative will be glad to give you further details. Also, write for the article, "O_2 Steelmaking," in the Spring issue of UNION CARBIDE METALS REVIEW.

* * *

SILICON IN COPPER -- First developed in France in 1881, silicon bronze is growing rapidly as a corrosion-resistant material for vessels, tubing, marine and poleline hardware, and electrical conduit. Up to 3 per cent silicon provides strength and hardness. For such additions, Union Carbide Metals offers a low-aluminum silicon metal. Since aluminum makes bronze sluggish in pouring, this special grade contains a maximum of 0.10 per cent aluminum. For further information, contact your UCM representative. Also, write for the article, "Silicon Strengthens Copper," in the Winter 1960 issue of UNION CARBIDE METALS REVIEW.

* * *

SERVICE ON THE MOVE -- Every year, experienced metallurgists of UCM's Metallurgical Service Division travel tens of thousands of miles to customers' plants. Their mission: to provide on-the-site help on the use of ferroalloys and alloying metals in melting. As an example, a Metallurgical Service representative worked with Electric Steel Foundry Company of Portland in evaluating the new fast-dissolving "Simplex" ferrochrome in stainless steel. The joint effort showed that 5- to 7-minute savings in furnace time could be made per 2,000 lb. heat. For a picture story of this cooperative service, write for "Service on the Move" in the Winter 1960 issue of UNION CARBIDE METALS REVIEW.

* * *

HIGHER DUCTILITY WITH CALCIUM-SILICON -- Two Midwestern steel foundries recently obtained data on Grade B steel castings made with and without calcium-silicon. In one test of 91 production heats, all of the heats treated with calcium-silicon and aluminum produced castings with satisfactory ductility. As a comparison, over 25 per cent of the heats deoxidized only with aluminum failed to meet reduction-in-area specifications. In another test of 20 production heats, a 15 to 20 per cent improvement in ductility (% RA) was reported. Further data can be obtained by writing for the article, "Calcium Improves Ductility of Steel Castings," in the Summer 1960 issue of UNION CARBIDE METALS REVIEW.

* * *

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 270 Park Ave., New York 17, N. Y. In Canada: Union Carbide Canada Ltd., Toronto.

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1 Adjustable speed from AC power
2 Accurate speed control
3 Wide speed range
4 Rapid response
5 Low power loss
6 Simplified construction
7 Remote control (when desired)
8 Quiet, efficient operation
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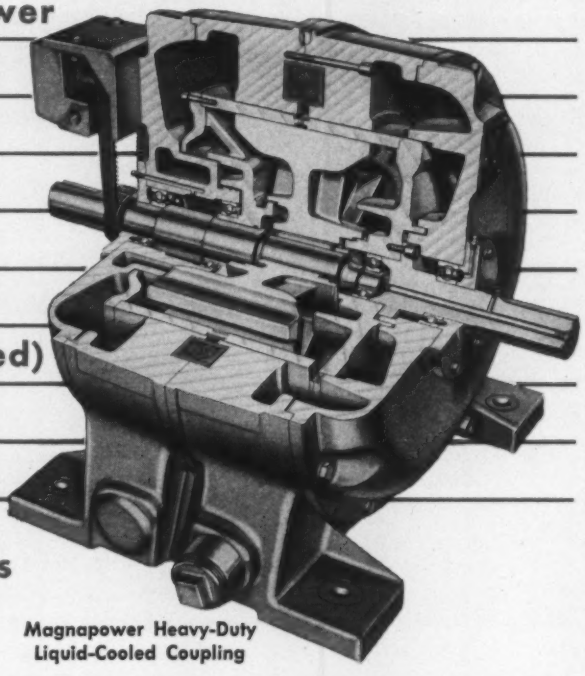
10 No commutators, rings, brushes, or rotating coils



Magnapower Heavy-Duty Liquid-Cooled Coupling

Using standard alternating current as a power source, Dynamatic Eddy-Current Couplings and Drives are the answer to practically all stepless adjustable speed requirements.

A wide range of standard and special control features may be obtained from electronic or transistorized magnetic amplifier control systems. The addition of an eddy-current brake to standard couplings or drives provides smooth, cushioned stops and controlled deceleration.

Dynamatic Eddy-Current Equipment is available in sizes from ¼ hp Ajusto-Spede Drives to heavy-duty Magnapower Couplings rated up to 20,000 hp—and larger.

Place your speed control problems in the hands of experts. Our representatives, located in all principal cities, are fully qualified to discuss your speed control problems and suggest Dynamatic Equipment that will do the best job for you. Call Dynamatic today—there is no obligation.

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Foreign Builders Sell Price, Quality

For example: A program controlled radial drill built in Czechoslovakia sells for about $7100. It has a 4 ft arm and can be pushbutton programed for 20 operations

FOREIGN-BUILT machines constituted one of the big attractions at the 2nd Coliseum Machinery Show in Chicago.

Exhibitors made it clear to the more than 30,000 visitors that they are competing in the U. S. with a price advantage, but most of their sales talks stressed quality and special equipment features. The implications: They expect their equipment to be strong in the U. S. machine tool market in terms of both price and quality.

• **Samples from Abroad**—A Man-Au-Cycle, heavy duty tracer lathe (completely enclosed in a glass and wire screen cage) was demonstrated, cutting a 4140 steel slug 4 in. in diameter. The rear tracer slide made a roughing cut, then a finish cut, and withdrew out of the way. The front cross slide took over for single point turning a No. 8 API thread, which took 12 passes to complete. Total time for the part was only 4 minutes. Another Man-Au-Cycle threading lathe cut an 80 in. long, acme thread on a bar 2½ in. in diameter. Job time: 32 minutes.

Corpet, Louvet et Cie, Paris, showed a beveling shear that will shear a steel plate, then bevel the edge—in the same stroke. A unique, double pivot brings the first square shear blade down, then turns it aside, brings the second, following blade across the edge at the bevel angle. The machine eliminates second handling that goes with beveling for weld preparation. The shear will be built by McKay Machine Co., Youngstown.

A rotary beveler, shown by American Pullmax Co. Inc., will bevel a 2 in. plate at 11 linear feet a minute. The Swedish machine sells for $3650.

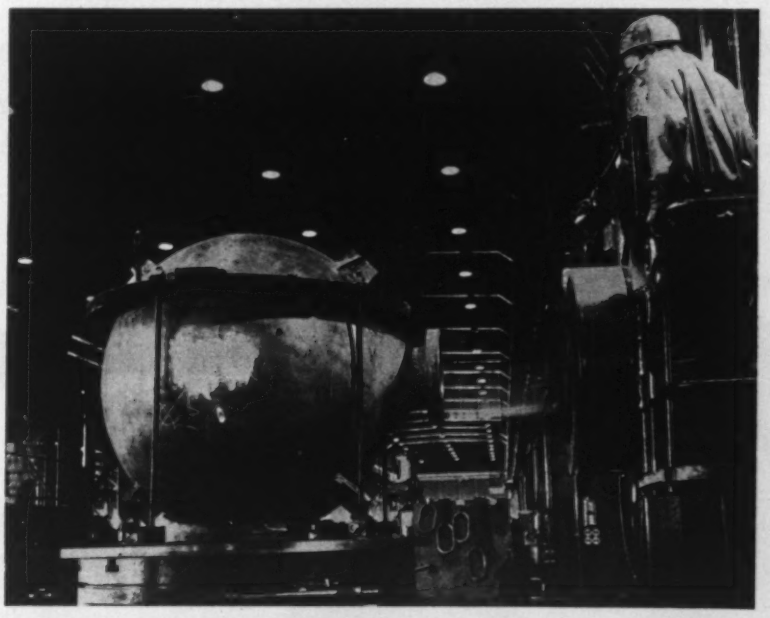
A French-built lathe, Cazeneuve, has 20 hp, and spindle runout is held to less than 40 millionths. One of the lathes was sold off the show floor—73 have been sold by its West Coast distributor in the last 18 months.

Sigma Machinery Co. showed a program controlled, radial drill made by MAS, Czechoslovakia. It sells for about $7100. The machine has a 4 ft arm and can be pushbutton programed for 20 operations, with speed, feed, and depth of cut included in the controlled cycle. In the same booth, an engine lathe featured a new spindle drive that eliminates all thrust loads to the spindle. Torque is applied through a spline. The exhibitor sold six machines at the show.

Lapointe Machine Co. showed a 2 in. bar, ram type, turret lathe with an extra slide support on the ram. It's built by H. W. Ward & Co. Ltd., Birmingham, England. The machine cut a 6 13/16 in. long, double ball handle from mild steel, using a ram mounted, live center. The entire length of the piece was shaped with a high speed steel, form cutter in one plunge cut. Time for the job was 2 minutes 45 seconds. In the same exhibit, a horizontal boring machine (Kearns & Co. Ltd., England) had both a facing chuck and a boring bar. The chuck and bar run independently; the bar feeds through the center of the chuck.

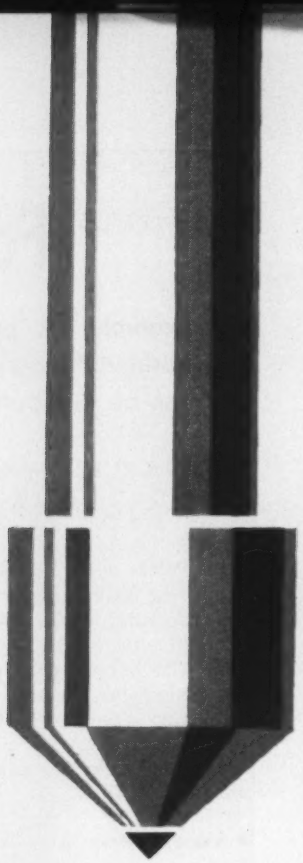
• **On the Books**—Exhibitors at the Coliseum agreed with most of those at The Machine Tool Exposition—1960 at the Chicago Amphitheatre: Managers who came to Chicago to see machine tools did so with the intention to buy. Nearly every exhibitor at both shows told STEEL that inquiries and interest shown indicate that the machine tool business should pick up in the fourth quarter.

The industry hopes that its third quarter slump means that customers were waiting for the shows.



COMPRESSED AIR FLASK FOR LAUNCHING POLARIS is shown in process of fabrication at Lukens Steel Co., Coatesville, Pa. Sixteen of them are in use aboard the missile submarine **George Washington**, which successfully scored two hits on a target area 1100 miles away. The flasks are nearly 4 ft in diameter, are built to withstand pressures of 7000 psi

Diamond-impregnated tool



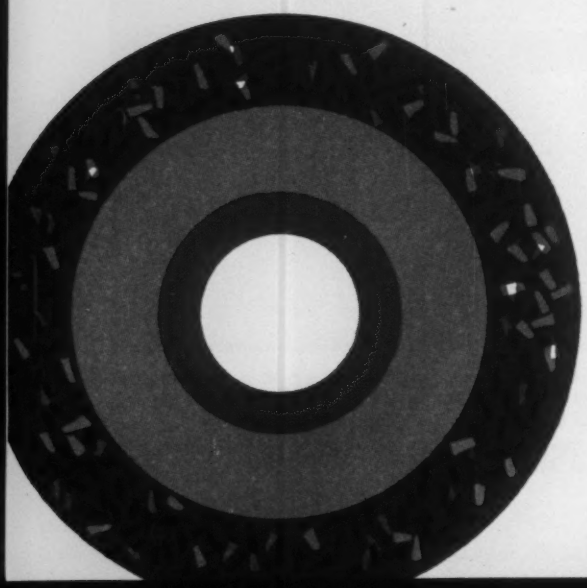
Truing tool

When you consider the job they do,

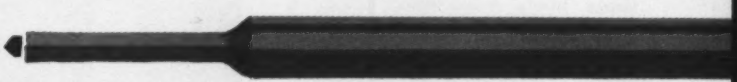
DIAMONDS CAN BE YOUR CHEAPEST CUTTING TOOLS

It's true that diamond tools may *seem* costly. But the real cost of any tool is the first cost divided by the work it does.

And diamonds usually work at higher speeds, do the job more quickly. Diamonds last longer, so tools don't have to be changed as often. Setups are reduced. Your people spend less of their time changing tools, more of their time operating machines.

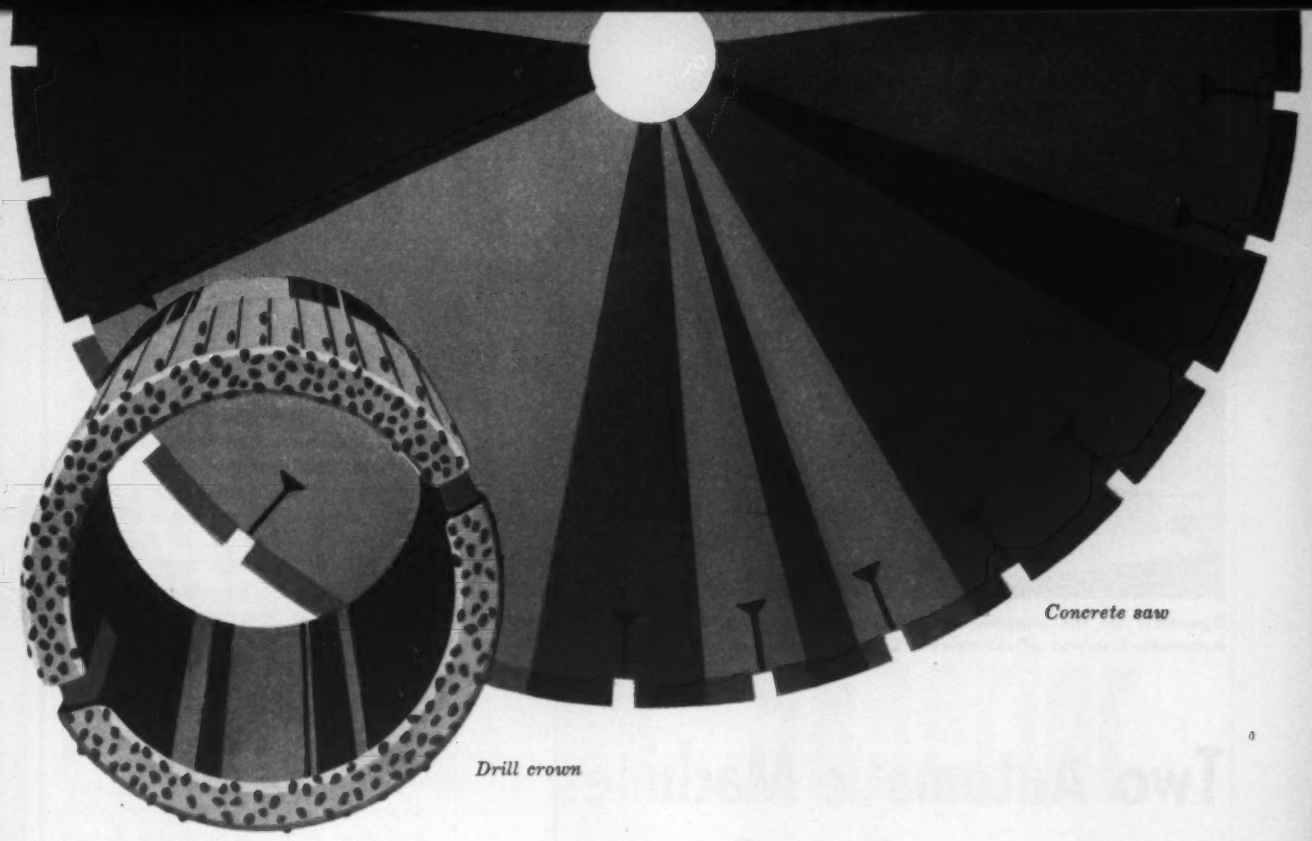


Grinding wheel



Engraving tool

Centering drill



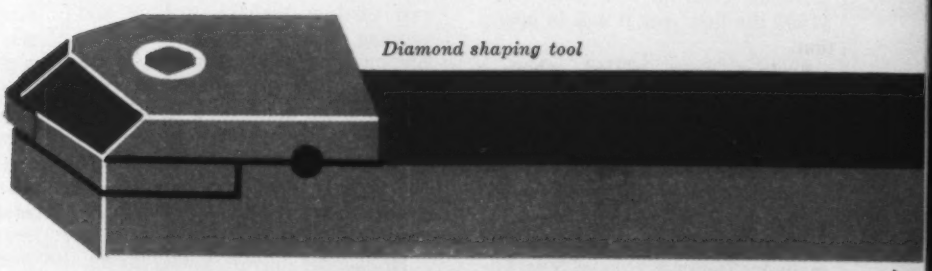
Concrete saw

Drill crown

Just how inexpensive diamonds can be for you, depends on the job you're doing. You'll have to try them to know. The biggest companies in the country, the ones that watch costs most closely, use industrial diamonds consistently.

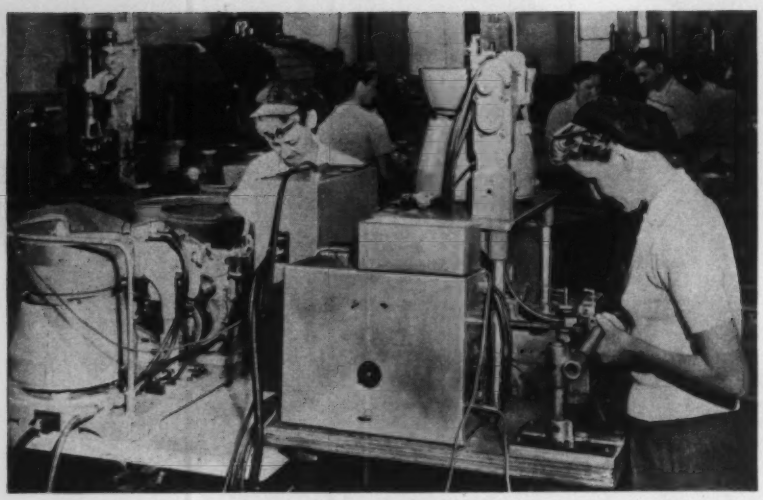
Next time you buy tools or wheels, try diamonds. Pit them against the cutting method you are now using. Chances are you'll find out how economical a diamond can be.

INDUSTRIAL DISTRIBUTORS (SALES), LTD., LONDON



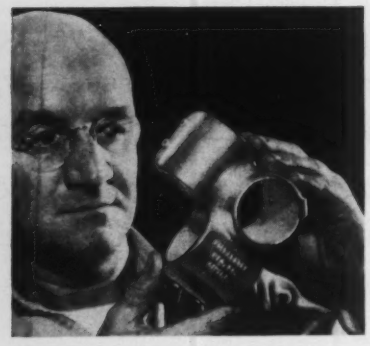
Diamond shaping tool

INDUSTRIAL DIAMONDS CUT PRACTICALLY EVERYTHING . . .
ESPECIALLY YOUR PRODUCTION COSTS



Operators set the machine for size, load the hopper, then depress a pedal for automatic insertion of setscrews. Castings are hand fed

Two Automatic Machines Are Better than One



With the automatic driver, setscrews are inserted to the right depth in each pipe fitting

An automatic set screw driver cut insertion costs in half and saved $1500 the first year it was in operation.

Savings were tripled when a second machine was added.

The units are used by Hollaender Mfg. Co., Cincinnati, in the assembly of setscrews for its Nu-Rail and Speed-Rail pipe fittings. Diameter of the screws is equal to length.

The first machine (a Setomatic, made by Standard Pressed Steel Co., Jenkintown, Pa.) made it possible for one operator to do as much work in 5 hours as two girls formerly did in 8 hours. A second machine eliminated 2 hour changeover time needed for different diameters. (One machine handles 5/16 in. screws, the other ⅜ in.) Now the units are changed only for length, which takes about 10 minutes.

Shipments were speeded to seven days (ten before).

• By licking the assembly bottleneck, the machines paved the way for further steps to automation.

Step two, the installation of rotary tables, is underway. It will speed up preliminary operations by integrating them with assembly. The four station tables will move raw castings through drilling and tapping, as well as Setomatic assembly stages. They're expected to cut finishing costs an additional two-thirds. The machine is capable of full automation insertion rates of 2500 screws per hour. Because of the variety of castings handled, an operator now positions them for insertion.

Hollaender operators who formerly hand started the screws and then ran them in with powered drivers, now simply load the Setomatic hopper (after the machine is properly set up for size or length) and then depress the foot switch. This feeds screws for automatic insertion at a rate controlled by the operator as she hand feeds castings for screw assembly.

• Uniform insertion depth has been a bonus, Hollaender says. Inspection needs have been reduced, and customer relations are better.

Formerly, it was necessary to back out as many as 50 to 60 per cent of the screws to insure proper clearance for the pipe that was later assembled into the fittings. Some screws that were too deep or too loose got by inspection. In some cases, the screws were lost in transit.

• New flexibility in adapting production assembly operations to demand has been an added benefit.

Hollaender is using its automated screw inserters on less than full shift operation, with an operator hand feeding the various styles of fittings. Screw insertions vary from 750 to 1200 per hour.

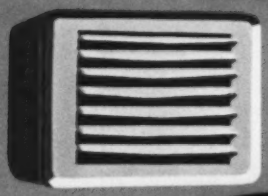
• The machine provides an additional check and quality control.

If a hole is poorly tapped, or screw is damaged, the driver shortens its stroke, and no damage occurs. A slip clutch on the driver spindle prevents damage. On the return stroke, the defective casting, or the damaged screw, can be removed. The unit is then ready to insert screws into the next correctly tapped fitting.

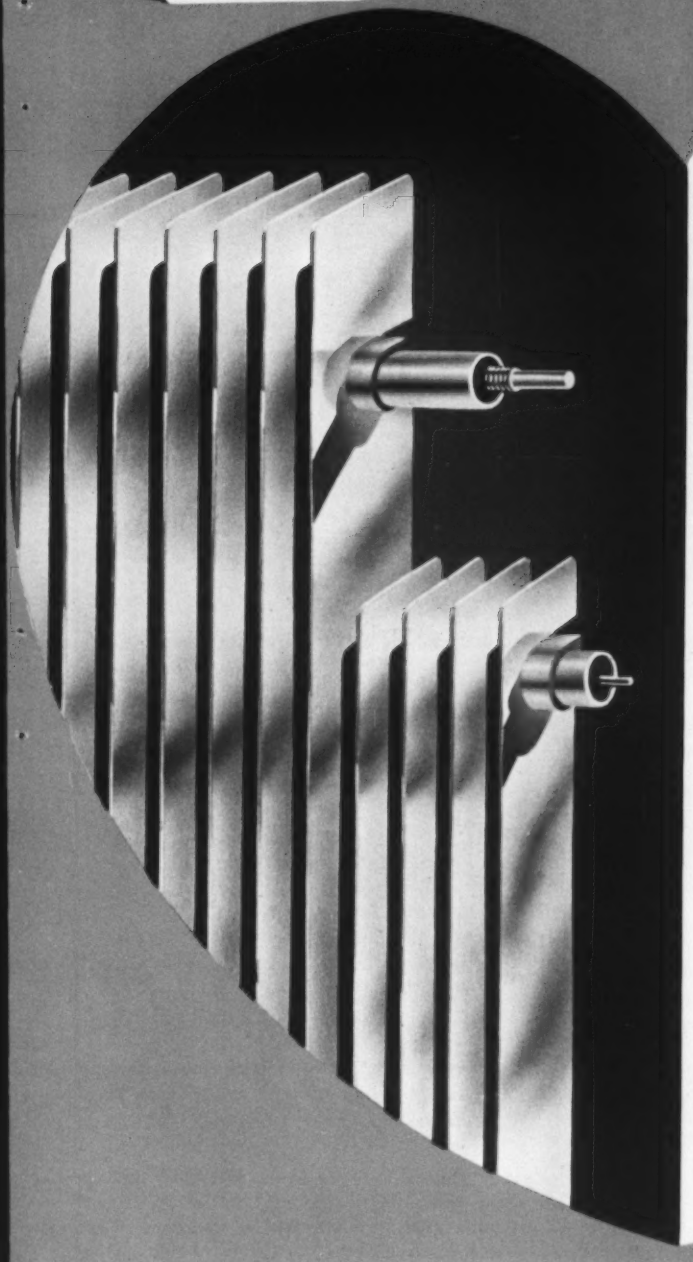
• The unit consists of two basic units which install screws horizontally.

The supply system picks up screws from a vibrating hopper, orients them, then feeds them into the driver feed tube. The drive mechanism picks up screws from the feed tube, inserts them into the tapped holes and tightens to a preset, closely controlled torque, or to a given depth.

The machine is designed primarily for integration with fully automated lines. It can be adapted for operation as a single unit, or as an operator controlled, semiautomatic screw inserter. The machine handles No. 4 through ⅜ in. diameter, to ¾ in. in length.



this electric unit heater has a stainless heart



for | better function
longer life

Superior

STAINLESS STRIP STEEL

The electric unit heater illustrated is a product of MARKEL Electric Products, Inc., Buffalo 3, N. Y.

In this high-efficiency, heavy duty electric unit heater, Superior Stainless Strip Steel does a vitally essential job. The helical coil elements are sheathed in our stainless—the heat-distributing fins are Superior Stainless too. Only stainless combines the physical strength, long life and corrosion resistance required by this exacting application . . . and *Superior* Stainless provides the unvarying quality and uniformity required for trouble-free fabrication. Can we serve your own special projects for stainless steel?

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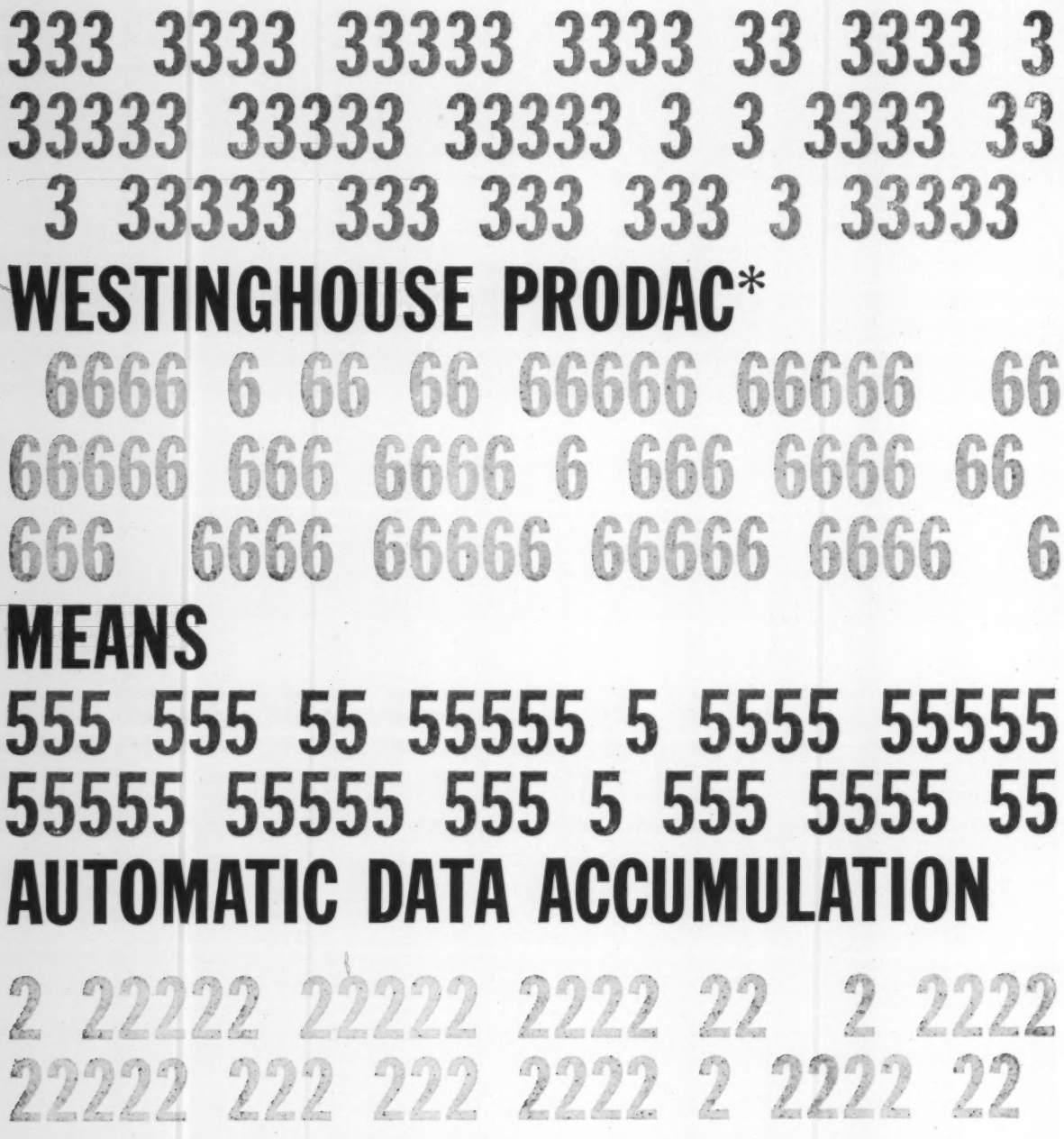


. . . keeps a permanent record of each foot of production . . . automatically registers all pertinent information and spots defect locations on the full production run. This is but one of the ways Westinghouse PRODAC† is now helping bring about the "mill of the future" today through completely automatic data accumulation systems.

Westinghouse has service-proven PRODAC installations that economically automate slabbing mills, blooming mills, reversing roughers, stock house materials handling and many other mill applications.

By specifying Westinghouse PRODAC for your mill, you open the door to many new cost-saving benefits which are unobtainable with conventional controls. For example, PRODAC assures the most consistent standards of quality control at the highest rates of production speed . . . coordinates operation of all machines at the over-all maximum efficiency . . . holds maintenance to a minimum, and practically eliminates control failures . . . gives you a "building block" design which provides flexibility required for future mill automation.

The entire team of Westinghouse PRODAC engineers is at your service to help you determine exactly where and how PRODAC can benefit you. Your Westinghouse sales engineer can give you complete information, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-22124-B

†Trade-Mark

*PROGRAMMED DIGITAL AUTOMATIC CONTROL

Westinghouse

STEEL

Fire Protection Network Dispenses Carbon Dioxide

A high pressure fire extinguishing system that can deliver 27,000 lb of carbon dioxide has been installed at Abbey Works, Steel Co. of Wales Ltd., Margam, by Walter Kidde Co. Ltd., of Northolt, England.

The system protects a 59,000 cu ft cellar storage area containing oil tanks, oil pumps, resistance panels, contactor panels, and magnestats serving a strip mill.

Multijet nozzles are mounted over the area, about 25 ft apart. Rapid discharge of carbon dioxide from the nozzles can smother any fire in a few seconds.

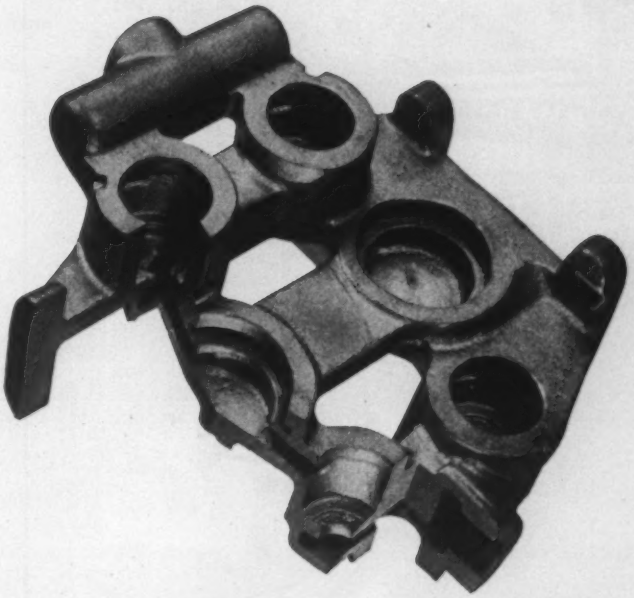
The system can be set for automatic actuation by 99 compensated, bimetallic thermostats, mounted on the ceiling about 18 ft apart. When the system is triggered automatically, 270 cylinders—each containing 100 lb of carbon dioxide—are emptied. Downstream from the cylinders is a pressure operated switch that sounds an alarm bell if the system is actuated automatically. It also switches off the room's ventilation equipment and cuts off electric power to machinery.

Pushbutton switches at convenient locations permit the system to be actuated manually. An electric delay device connected to the manual switch circuit allows personnel 15 seconds to evacuate the cellar while the alarm bells are ringing.

Master switches are at the three cellar entrances. A lamp on each switch indicates that it is dangerous to enter the cellar and that the system has operated automatically. It also indicates when the circuit is set for automatic operation and might discharge without warning if a fire is started. Another lamp indicates when the automatic actuation circuit is disconnected.

Burners Boost Efficiency

Thermal efficiency of open hearth furnaces can be greatly improved by mobile, multiple burners, firing through the roof, says Blaw-Knox Co., Pittsburgh. Several installations of the new firing system, developed in France, are being engineered by Blaw-Knox, which has license rights in the U. S.



CAUSTIC SOLUTION

A CASE IN POINT—This is a 19 pound Ni-Resist valve body designed to handle caustic fluids at 400 psi. It was cast for the John Bean Division of Food Machinery & Chemical Corp. Ni-Resist is ideal for this application because it combines high corrosion resistance with superior resistance to erosion from high velocity fluids.

The intricate coring required demands unusual skill to produce Ni-Resist castings leak-proof at 400 psi operating pressures. Hamilton Foundry succeeded in producing pressure tight castings, an accomplishment difficult for the best of foundrymen.

When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

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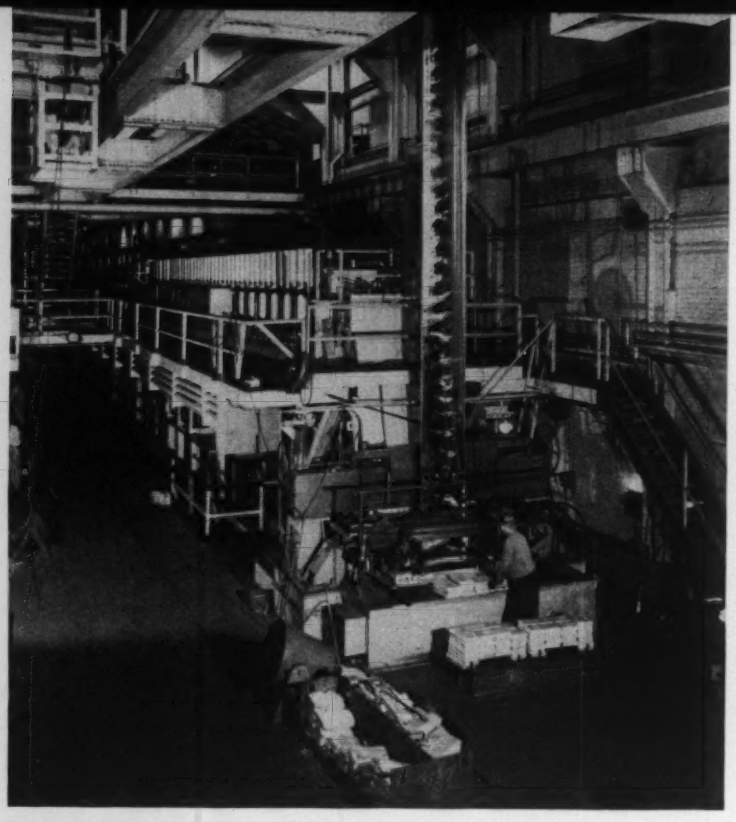


Steel strip passes through oxidizing and reducing atmospheres in the furnaces (background) before it is immersed in molten zinc at Inland Steel's Indiana Harbor Works

Strip Galvanizing Gains Popularity

Demand for metallic coated steel sheets is expected to grow faster than the market for unfinished material because of possible cost savings and longer service life

INCREASED fabricator acceptance of galvanized steel strip and the promise of new applications for the material have continued to encourage investment of steel company capital in equipment to apply zinc coating. Example: Several lines employing the Armco-Sendzimir galvanizing process have been put into operation recently, and others will be completed soon.

The process, pioneered commercially by Armco Steel Corp., Middletown, Ohio, is used by other firms under a license agreement with Armco.

Furnace equipment, an important item on the lines, has been furnished in many installations by Electric Furnace Co., Salem, Ohio.

• Demand for coated sheets is expected to grow rapidly; welding techniques may be modified for more effective fabrication.

"The market for galvanized and aluminized materials will grow faster than the sheet market in general," says T. F. Olt, Armco's vice president-research and technology, "because of the cost advantages. Galvanized sheets sell for about 1.2 cents more per square foot of coated area than uncoated material; aluminized sheets sell for about 2.9 cents more per square foot vs. about 2.5 cents per square foot for a typical finish applied after fabrication.

"A good galvanized surface can be expected to last about seven years in a mild industrial atmosphere; the life of aluminized surfaces is much longer, and hasn't been definitely determined."

Constant quality improvement in galvanized and aluminized products will open new market areas, says K. Oganowski, director of metallic coating research at Armco. Air conditioning units and other equipment operated in humid environments will have better corrosion resistance, thanks to coated materials.

"Welding techniques should be studied carefully and adapted to materials precoated with zinc or other metals," says Mr. Oganowski. "That would lead to further improvement in the finished products."

• The process features oxidation and subsequent reduction of the steel strip, then immersion in molten zinc.

The base metal is heated and cooled in furnaces with prescribed atmosphere zones. Oxidation by heat removes lubricants and other combustibles. It also provides a uniformly oxidized surface. Then the surface is reduced and annealed. Material enters the zinc bath at a temperature that permits instant wetting and positive bonding.

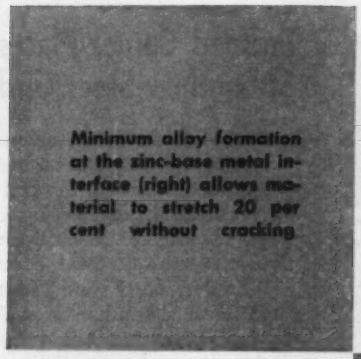
Formation of iron-zinc alloys in the galvanized material is controlled by adding aluminum to the zinc bath. That can be done because the gas prepared surface requires no flux.

Presence of a minimum of iron-zinc alloys is said to improve ductility of the coated material and give it better drawing characteristics.

Dross is removed from zinc baths on the continuous lines every three to four months vs. six to eight days for pots used in sheet dipping.

• Changes in size or design of coating equipment are usually made to increase productivity.

"The trend in processing equipment is toward wider lines, running at higher speeds, and processing greater tonnages of strip per hour,"



Minimum alloy formation at the zinc-base metal interface (right) allows material to stretch 20 per cent without cracking

Highly alloyed interface (left) separates after 15 per cent elongation

says Mr. Oganowski. "Armco's 72 in. line will be running at Middletown early in 1961.

"It's rated at 30 tons per hour."

The company is operating two, 50 in. lines at Middletown, a 50 in. and a 60 in. line at its Ashland (Ky.) plant, and two lines—one 38 in. and one 48 in.—at the Butler (Pa.) works. The original Armco-Sendzimir line, which went into operation at Butler in 1936, is no longer used for galvanizing (the company has modified it for other process work).

Galvanizing lines can be revamped and used for aluminizing, but the downtime required for such a changeover reduces equipment productivity. Armco's Butler lines can be used for either process. At present, they are producing aluminized grades.

One of the lines at Middletown is to be revamped for conversion to aluminizing. But even the convertible lines must be shut down for some time when they are switched from one metallic coating to the other.

The new, wide line at Middletown isn't expected to produce aluminized grades, but it could be modified for such use if product demand dictated it.

• Other steel companies are using, planning, or considering installation of the metallic coating lines.

Two, 50 in. lines and a 60 in. line are in operation at the Indiana Harbor (Ind.) Works, Inland Steel Co.

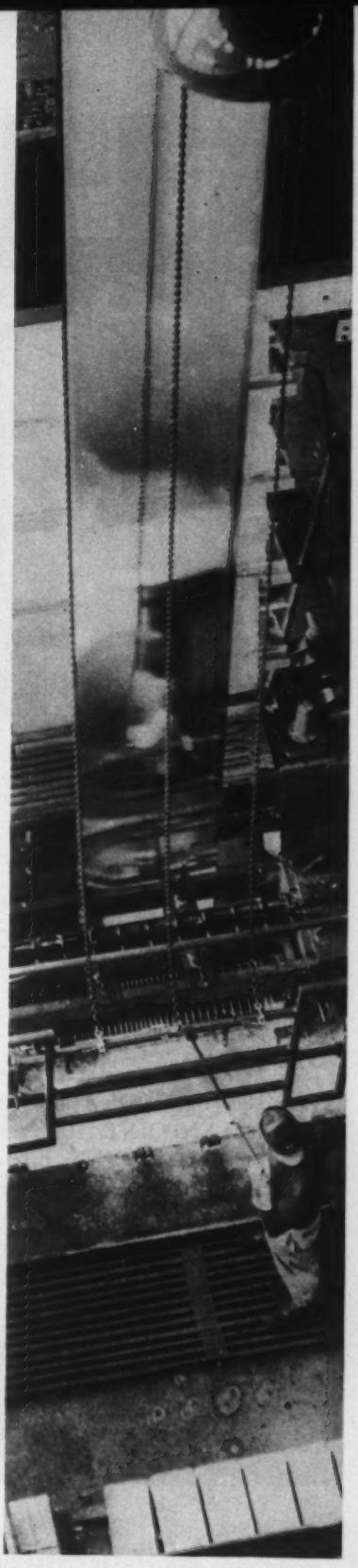
A fourth line (also 60 in.) will be running early in 1961.

A 48 in. line at the Indiana Harbor Works of Youngstown Sheet & Tube Co. will put that company in the continuous galvanizing business.

A 50 in. line is in operation at the Pittsburgh Works of Jones & Laughlin Steel Corp. Two lines (one 50 in., the other 60 in.) are running at Dominion Foundries & Steel Ltd., Hamilton, Ont. (The second line began production in June.)

Another 50 in. line will be operating in Canada by the end of the year, at Steel Co. of Canada Ltd., Hamilton, Ont.

Armco-Sendzimir lines are also operated in Germany, Italy, England, France, Japan, Argentina, and the Union of South Africa.

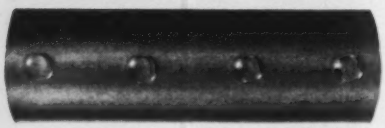


Strip leaves the zinc bath on one of Armco Steel's galvanizing lines at Middletown, Ohio. Dross is removed from the bath every three to four months vs. six to eight days for pots

ALLEN

Allenpoint's deep, full-circle bite assures tremendous resistance to removal torque! Stays tighter longer!

When you need a set screw that you can depend on to stay tight under heavy strain and vibrations, specify ALLENPOINT. Here's why you can always depend on ALLENPOINT: proper design of the cup diameter results in a rugged grip that makes the full-circle pattern you see here... deep, strong, clean sockets allow full wrenching leverage... and uniform Class 3A threads assure a tight friction lock over the entire length of Allenpoint Set Screws.



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50 ANNIVERSARY YEAR ALLEN HEAD 1910-1960

ALLEN MANUFACTURING COMPANY

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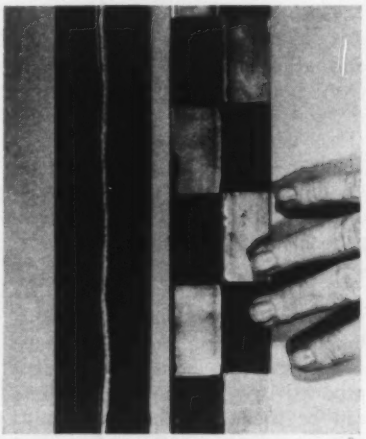
Inclined Corner Plates Strengthen Steel Girder

A steel girder with inclined corner plates for increased strength has passed its first tests at the University of Washington engineering station, says Edward N. Allen, president, Pacific Northwest Steel Fabricators Association. Tests were directed by Prof. F. B. Farquharson and Prof. Desi Vasarhelyi. The girder was designed by a Seattle engineer, Homer W. Hadley.

The design: A basic I-beam with a pair of full length, inclined plates welded across the upper corners. Automatic welding equipment permits fast fabrication. The plates, welded to each side of the vertical web, slant upward to meet the flange. That creates a pair of closed, triangular boxes, extending the length of the girder. Vertical stiffeners are eliminated, except at points of heavy load concentration.

The girder is said to make for less unbraced depth for the vertical web, lighter weight, high torsional resistance, resistance to lateral deflection, and lower fabrication cost.

Clean appearance facilitates painting, a factor which will help reduce construction costs.



WELDING ARCS WANDER from one side of a joint to another because of surface oxides and impurities, claim research people at Boeing Airplane Co., Seattle. To simulate such conditions, engineers created scientifically dirty surfaces. The checkerboard specimen was chemically oxidized. The other was heated in spots with a gas torch. The knowledge points up the need for preweld cleaning of aircraft steel alloys

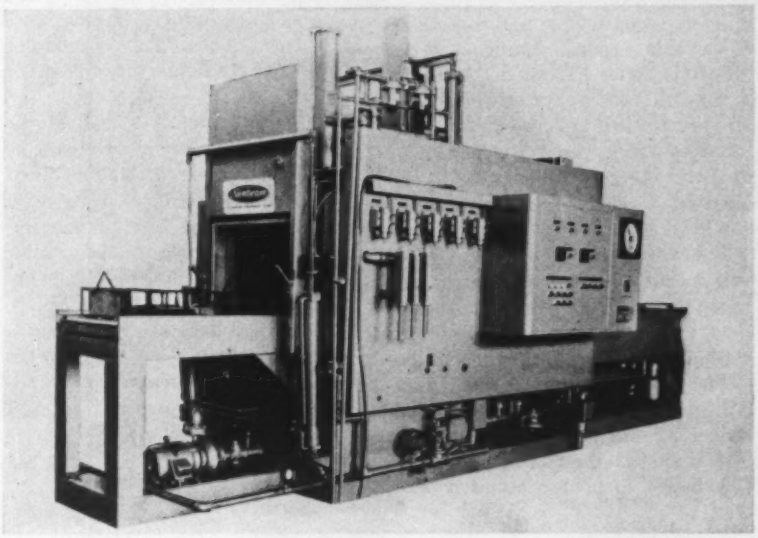
Atmosphere Controlled Furnace Treats Small Parts

HERE is an atmosphere controlled furnace that can be used for carburizing, carbonitriding, carbon restoration, normalizing, annealing, and hardening up to 1850° F. The manufacturer says it's equally effective as a multipurpose furnace in a heat treating department or for processing in a continuous production line.

The unit can be built with work space dimensions up to 50 x 32 x 26 in. In one load, it can handle up to 1500 lb of bearings, instrument parts, tubes, gears, bushings, shafts, hinge pins, bolts, nuts, chains, and other similar parts.

Automatic operation makes loading easy, fast, and safe.

Another Sunbeam development is a recirculating furnace for annealing, tempering, and stress relieving of ferrous and nonferrous alloys from 300 to 1400° F. Small and large parts may be heated together under accurate temperature control. A high volume fan is used



to help assure rapid and uniform work heating. Gas fired or electric heater units are available.

A new pit recirculating furnace has a temperature range from 300 to 1400° F. Seven standard sizes are available.

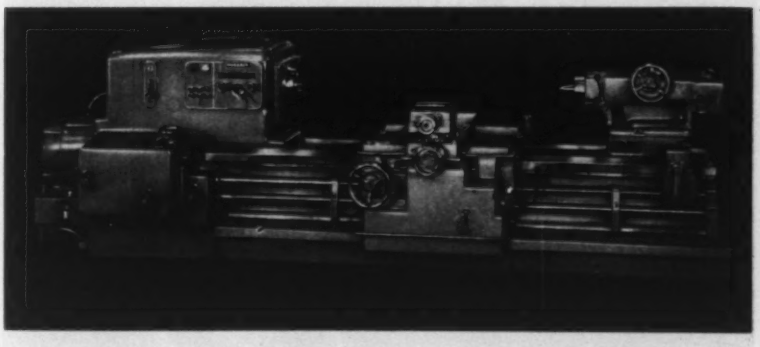
For further information, *write* Sunbeam Equipment Corp., 180 Mercer St., Meadville, Pa.

Heavy Duty Lathe Has 36 Speeds from 6 to 750 rpm

THE HEAVY duty lathe designated Series 91 Dyna-Shift has the weight, power, and general features for metal removal limited only by the tool and characteristics of the workpiece.

With the Dyna-Shift headstock, the operator works in terms of surface cutting speed. The machine automatically calculates the revolutions per minute and sets up the shift. Only two dials require setting—one for work diameter, the other for desired surface speed.

Speeds (36 are available) range in geometrical progression from 6 to 750 rpm. Final work drive is through helical gears. The clutch and brake are hydraulically actuated and self-adjusting for wear. The main drive motor is rated from 40



to 60 hp. Headstock drive is through multiple V-belts. Chutes lead chips into an open pan at the rear of the unit. With no chip pan obstruction in front of the machine, the operator can get in close for convenient work setup and workpiece change. The unit is offered in three models.

• **Rotary Profile Tracer Lathe**—Model 612 was developed for boring bottle molds having a noncircular cross section. Other applica-

tions include the machining of plastic molds, aircraft parts, cams, and rotors. The lathe is equipped with an electrohydraulic tracer. The unit (basically a 612) can also do conventional turning, boring, and threading.

• **Variable Speed Lathe** — The Monarch Series EE, Model 1000, is a versatile, 15 hp, precision lathe for manufacturing or toolroom use. It swings 16 in. over the bed, 8¾ in. over the cross slide and is offered in 30 and 54 in. center distances.

The machine has infinitely variable speeds (forward or reverse) between 20 and 2000 rpm.

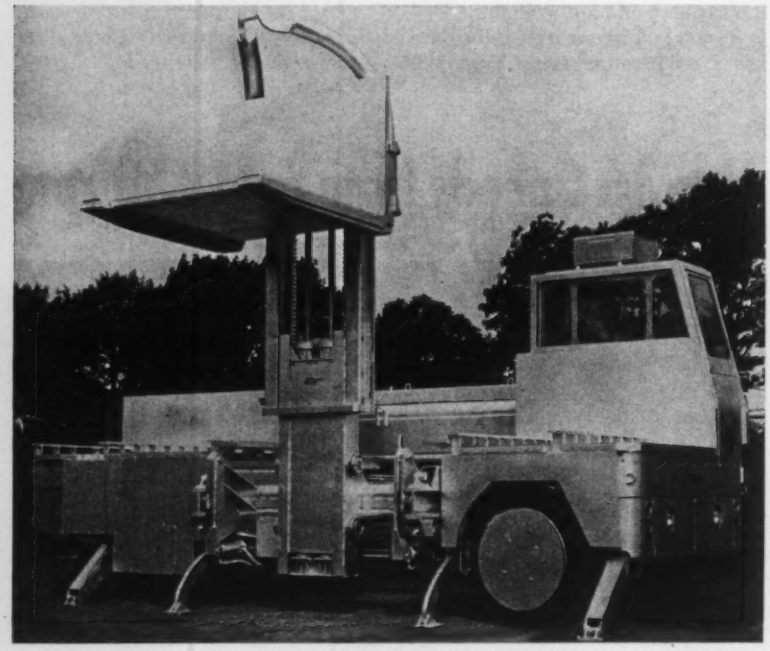
• **Shaft Finishing, Production Lathe** —The shaft finishing, production lathe is a special adaptation of the Model 21 and is designed to finish multidiameter shafts (on a production basis) to precise accuracy and finish tolerances. Work diameter limit is 0.0002 to 0.0004 in., depending on length. Finish is 40 microinches or better.

• **Control Systems**—A 360 degree, two axis, electrohydraulic, tracer system (Electro-Gage Tracer) is recommended for machining parts having complex contours. The electronic equipment is designed into transistorized plug-in modules. The factory installs the system on new lathes.

The Pathfinder is a control system for numerically controlled, contour turning. It continuously coordinates the relative distance of motion and feed rate of the machine slides to produce the contour dictated by the numerical information.

Numerical data control the turret position, coolant, feed or traverse and selection of motor speeds (18 within a 4 to 1 range).

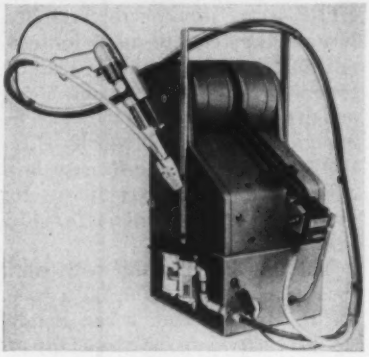
For further information, *write* Monarch Machine Tool Co., Sidney, Ohio.



LOADS UP TO 30,000 LB CAN BE LIFTED AND CARRIED by this sideloading lift truck. The unit has special insulation and cab air conditioning for transporting billets heated to 1652° F. The unit was purchased by Dorman-Long Ltd., Middlesbrough, England. It's estimated that the truck will handle 50 tons of steel an hour on a 24 hour basis. For further information, **write** Baker Industrial Truck Div., Otis Elevator Co., 8000 Baker Ave., Cleveland 2, Ohio

Unit Automatically Sorts, Meters, Installs Screws

SCREWS, pins, bolts, rivets, and studs can be sorted, metered, and installed at rates as high as 7000 an hour with automatic Clyde equipment.



The standard unit has a hopper with switch controlled feed and a standard power screw driver pneumatically fed through plastic supply hoses. In operation, the screw centers the screw driver on the hole. Up to 12 screw drivers may be operated from one hopper, and operators may work on a radius up to 50 ft from the hopper with normal shop air pressure. The hopper may be monorail mounted to follow workers, or the system may be set for automatic production line service.

For further information, *write* Clyde Engineering & Mfg. Corp., 937 E. Ten Mile Rd., Madison Heights, Mich.

'Hazard-Safe' Unit Heats Volatile Liquids

ALCOHOLS, gasoline, petroleum, naphtha, and other flammable materials can be heated in the Blue M Hazard-Safe, mechanical convection, horizontal airflow ovens.

A Power-O-Matic 60, saturable power reactor control system provides straight line control. There are no contacts, switches, moving parts, or auxiliary mechanisms to wear, burn, or arc. Danger of gas ignition is eliminated.

Tube inlets, exhaust ports, air chambers, and work chambers are welded vaportight to confine vol-

(*Please turn to Page* 132)

Mr. S. E. Miller, Vice President and Division Manager of American Bosch Arma, shows the hundreds of items which go into the manufacture of a fuel injection pump (upper left of table).

IBM MOS

MANAGEMENT OPERATING SYSTEM SAVES AMERICAN BOSCH $120,000 YEARLY ON SHOP ORDERS ALONE

...TRIPLED SAVINGS ANTICIPATED WHEN SYSTEM IS EXPANDED!

American Bosch has turned to IBM's new systems techniques for faster, more sensitive control of its manufacturing cycle at the Springfield, Massachusetts, plant. Utilizing the IBM Ramac 305, the Management Operating System has been applied to Materials Planning and Inventory Management, and large savings have already accrued.

These additional savings are expected from methods now in use:

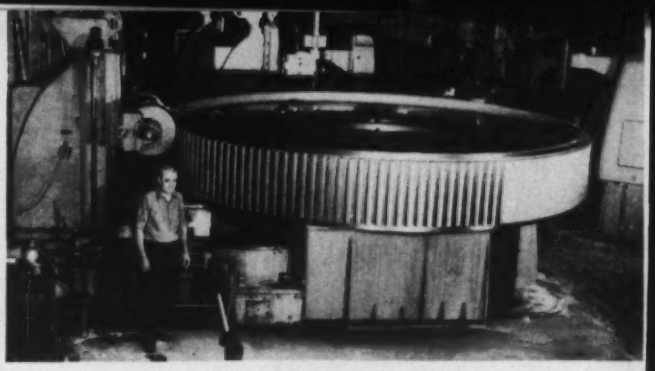
■ sharp reduction of machine setup costs. ■ standardized production levels, to minimize manpower fluctuations and concentrate inventory dollars on active sales items. ■ substantial time reduction in production schedule changes. ■ automation of annual standard cost revisions, with a 70% expense cut.

When the Management Operation System is extended to other areas, American Bosch estimates that savings will be tripled.

MOS can be applied to most industrial operations, with specially trained manufacturing representatives to assist you. IBM Balanced Data Processing provides comprehensive support in applying the system to your company's operation. For full information, call your nearest IBM office.

BALANCED DATA PROCESSING

IBM



Big gear hobbing jobs like this one are everyday jobs for Chicago Gear. STANICUT Oil 208 BCS is the cutting oil used in all gear manufacturing machines.

Chicago Gear Mfg. Company tames tough steels, cuts costs with STANICUT Oil 208 BCS

Tames tough steels. Gears from one to 300 inches in diameter are machined by Chicago Gear. Steels up to 375 Brinell hardness are worked. STANICUT Oil 208 BCS helps them do it. STANICUT 208 contains maximum amounts of sulfur, chlorine and compounding to make it suitable for handling tough alloy steels. It is viscous enough to stay on big tools and work pieces, yet fluid enough to flow over the work in sufficient volume to assure good cooling.

Cuts costs. STANICUT Oil 208 BCS is used at Chicago Gear for all gear hobbing operations and for all other applications requiring a straight cutting fluid. There's no chance of the wrong fluid being used, thus no costly losses. One fluid cuts down inventory, saves time in keeping track of stocks, cuts paper work handling and ordering.

Gets service. Standard Oil's Dick Erickson is assigned to the Chicago Gear account. Dick has a degree in mechanical engineering from Purdue plus several years' experience providing customers with technical help on lubrication. With this experience and training, Dick knows how to help a customer, knows how to supply technical help where it counts. Could STANICUT Oil 208 BCS and Standard Oil technical service help you? Ask about them at the Standard Oil office near you anywhere in the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

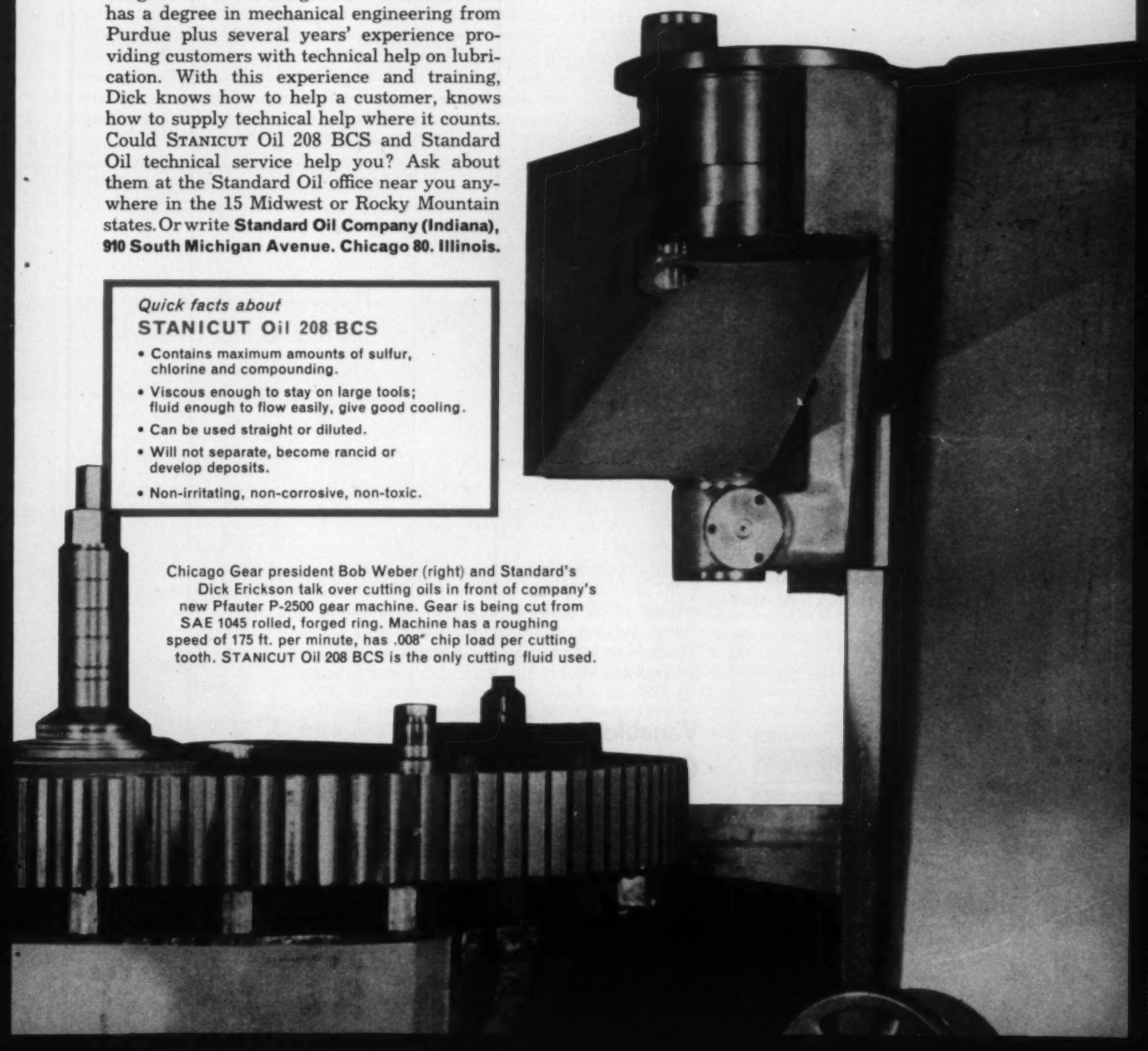
Quick facts about

STANICUT Oil 208 BCS

- Contains maximum amounts of sulfur, chlorine and compounding.
- Viscous enough to stay on large tools; fluid enough to flow easily, give good cooling.
- Can be used straight or diluted.
- Will not separate, become rancid or develop deposits.
- Non-irritating, non-corrosive, non-toxic.

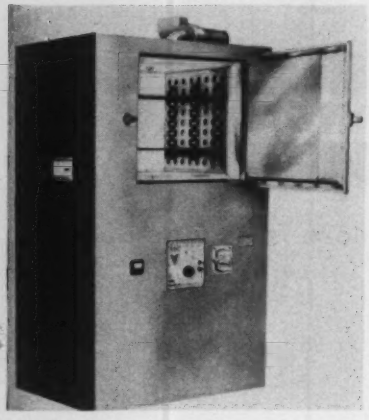
STANDARD

You expect more from Standard and you get it!



Chicago Gear president Bob Weber (right) and Standard's Dick Erickson talk over cutting oils in front of company's new Pfauter P-2500 gear machine. Gear is being cut from SAE 1045 rolled, forged ring. Machine has a roughing speed of 175 ft. per minute, has .008" chip load per cutting tooth. STANICUT Oil 208 BCS is the only cutting fluid used.

(*Continued from Page* 128)



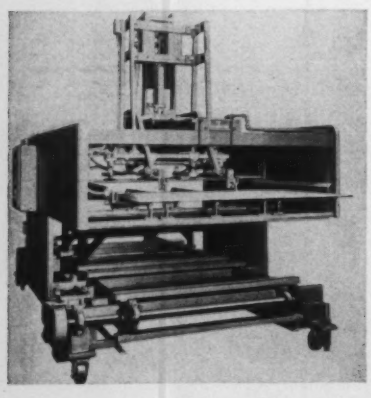
atile gases and flammable materials within the unit. All units in the series are designed with backwall relief panel and safety cage. The door is equipped with an explosion proof release lock.

For further information, *write* Blue M Electric Co., 138th & Chatham Street, Blue Island, Ill.

Cycling Automatic on Destacker, Sheet Feeder

THE destacker and sheet feeder made by Die & Automation Inc. is a self-contained, floor mounted unit. Pits or foundation are not required. The unit has automatic cycling, manual inching controls, and a sheet separator. Several sizes and arrangements are available.

The unit can lift one sheet from a stack, index forward, and deposit the sheet on the feed station. The lifter mechanism then returns and picks up another sheet. As that sheet is indexed forward to the feed station, pushers attached to the lifter mechanism push the previously loaded sheet from the feed station through a double sheet detecting device into such machines as a punch press, shear, roller leveler, or roller applicator. Pallets can be used with the unit.

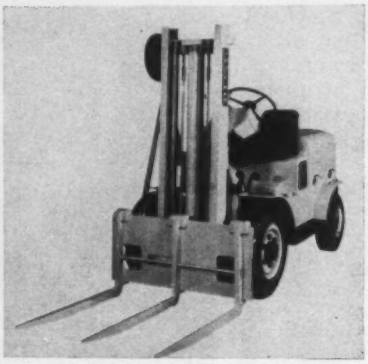


For further information, *write* Die & Automation Inc., 5353 Dixie Highway, Hamilton, Ohio.

Lift Truck Line Narrower, Speedier

A 3000 LB, fork lift truck (Y-3024) made by Truck-Man is new. The firm has also revised the 4000 lb capacity (Y-4024) and 5000 lb capacity (Y-5024) lift trucks.

Power steering is standard on the Model Y-3024. Other features include a 12 volt electrical system for rapid cold weather starts, and exhaust system designed for reduced back pressure and quieter operation, and a conveniently located instrument panel.

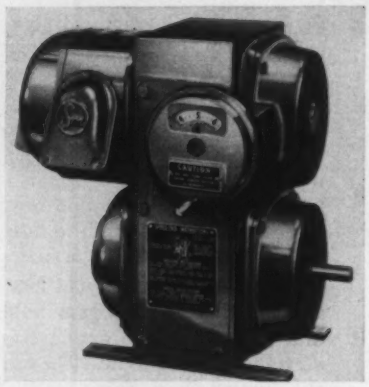


The frame has been narrowed by 7 in. and lift speeds have been increased to 55 ft per minute.

For further information, *write* Truck-Man Lift Trucks, 612 Liberty St., Jackson, Mich.

Variable Speed Drive Offered in Three Ratings

A COMPACT, light, fractional horsepower variable speed drive has speed ranges from 1.2 to 4660 rpm with up to 10 to 1 variation in 1/4, 1/2, and 3/4 hp ratings. Larger pulley diameters assure a cooler running, longer lasting belt.



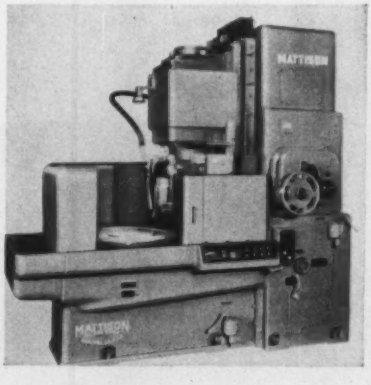
Retention of NEMA standard dimensions for shaft height and diameter permits substitution with standard motors. The unit may be foot mounted (in any position) or it can be furnished with a face mounting bracket. It's available with right angle and helical gears. Single phase or three phase models are available. Dripproof, explosion proof, or totally enclosed types are offered.

For further information, *write* Sterling Electric Motors Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.

Horsepower on Rotary Surface Grinder Hiked

SPINDLE horsepower up to 125 is backed up by a one piece, box type column on the No. 24, vertical spindle, rotary surface grinder. Capacity is rated up to 48 in. (diameter).

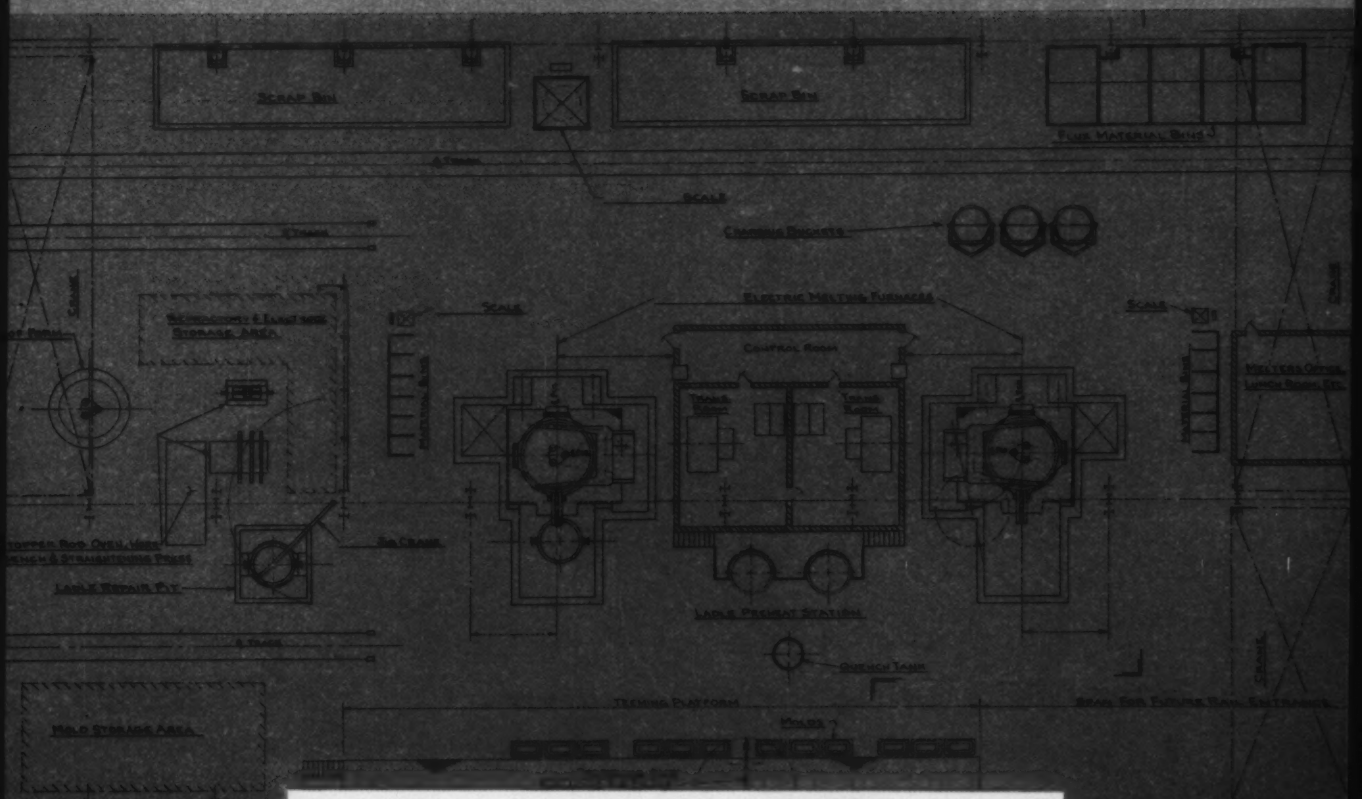
Power spindle tilting converts the unit for roughing or finishing in a few seconds. Wheel tilt is used to rough grind parts to within a few thousandths of final size. Horsepower and rigidity have been in-



SWINDELL-DRESSLER

ONE HUNDRED AND TEN YEARS OF SERVICE TO THE METALS INDUSTRY

ENGINEERS



Swindell-Dressler engineering for the metals industries is as broad as the widest project requirements—covering every aspect of plant design and construction supervision. From feasibility studies, site evaluation and reports, through electrical and mechanical layouts, trackage, procurement, cost control—any or all factors on the way to completion and owners' key are handled with entire experience and responsibility by this leading engineering organization. Whether your future plans are for a new steel mill, departmental expansion, or remodernization of a melting shop, call us for preliminary discussions that will aid in defining the project. Write, phone or wire.

SWINDELL-DRESSLER CORPORATION

Engineers and Manufacturers

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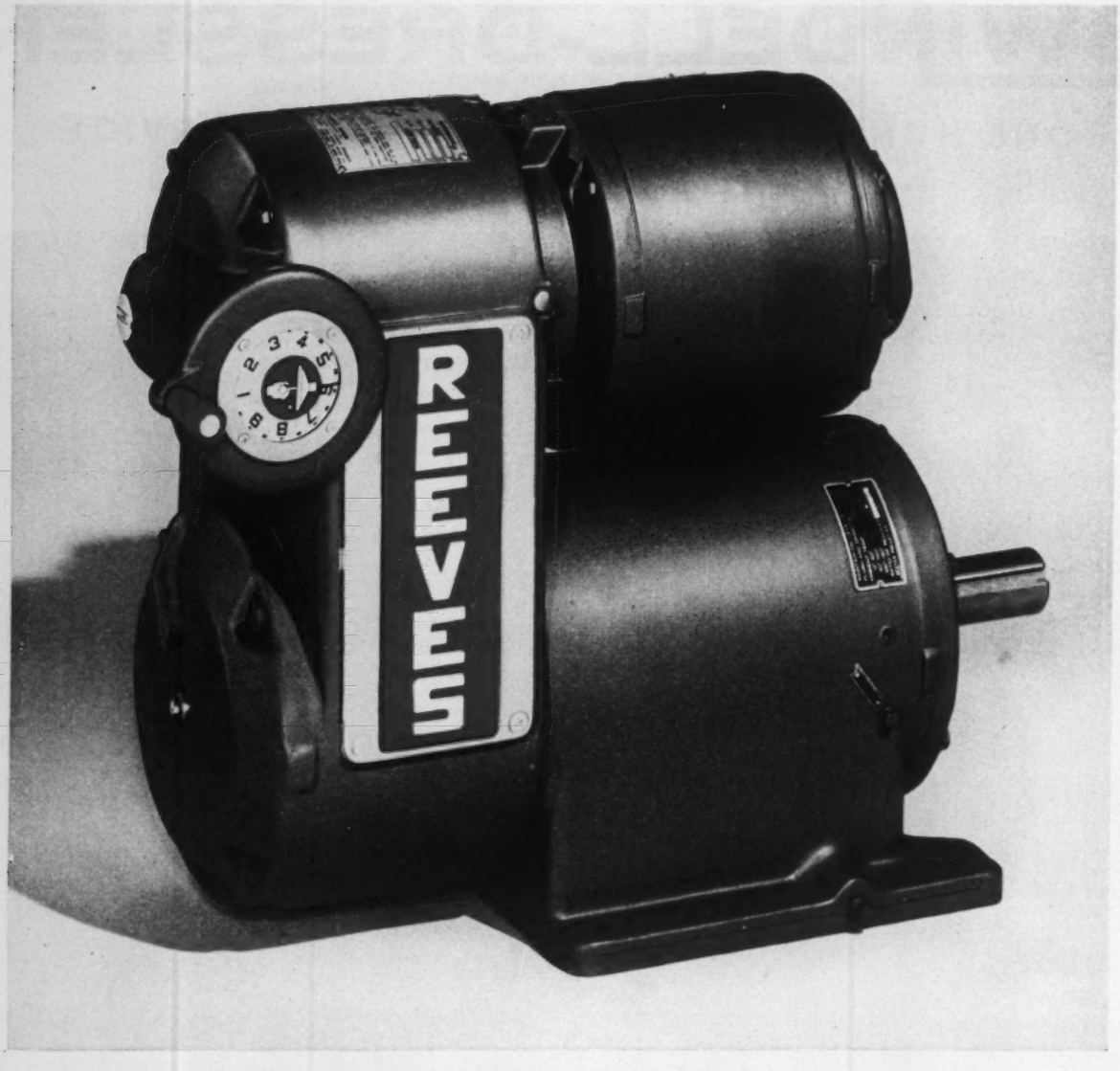
SUBSIDIARY OF PULLMAN INCORPORATED



REEVES Vari-Speed Motodrive

packed with new flexibility . . . broader production use

Now available in this compact design, Reeves Vari-Speed Motodrives deliver 2:1 through 10:1 speed variation, 1.8 through 4660 rpm . . . ¼ to 20 hp.

The infinitely variable output speeds meet almost every production need.

You can get these drives with output shaft on same or opposite side of the motor; vertical, 45°, horizontal or trunnion models; no reducer, and single, double or triple stage reductions . . . hundreds of space saving assemblies. Reeves provides a full range of modifications, accessories, and manual, remote or automatic controls. G-1039

Product of the combined resources of Reliance Electric and Engineering Company and its Master and Reeves Divisions

RELIANCE ELECTRIC AND ENGINEERING CO.

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Canadian Division: Toronto, Ontario

Sales Offices and Distributors in Principal Cities

Duty-Master A-c. Motors, Master Gearmotors, Reeves Drives, V★S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.

creased to take advantage of grinding wheel improvements.

Grinding wheel downfeed is continuous from 0.005 to 0.165 in. per minute. When work reaches desired size, a preset stop causes the wheel to disengage. Two automatic sizing systems are offered to control quality and cycle time. Minimum capacity of the coolant pump has been increased from 50 to 75 gallons per minute.

For further information, *write* Mattison Machine Works, Rockford, Ill.

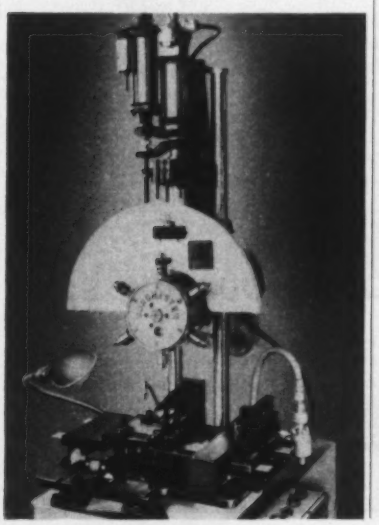
Power Feed Featured on Automatic Turret Drill

PRECISION holes are quickly drilled with an automatic turret drill made by Burgmaster. The unit has a manual positioning table and power feed. The need for box fixtures and jigs is eliminated, says the company.

The drill is synchronized to the controls of an accessory manual positioning table which rapidly locates each hole center within 0.0005 in. The free floating table is mounted on ball bearings. A pointer over a template of the hole pattern quickly guides the operator to each position.

The controls permit manual, semiautomatic, and automatic operation. The unitized control panel

(*Please turn to Page* 138)



10 to 15 times longer SERVICE LIFE with...

COWLES Carbide SLITTING KNIVES

● Extraordinary results side trimming tinplate, also side trimming and gang slitting light gauges of high and low carbon steel, silicon, tinplate stock, aluminum, brass, copper and other light gauge materials. Permits slitting and side trimming machines to remain in continuous service for long periods without shut-down for re-grinding. Puts all operations associated with slitting and trimming on a practically continuous, uninterrupted basis, cutting costs and increasing output. Solid carbide or carbide rim in steel hub construction. Furnished in a wide range of sizes to meet any side trimming or gang slitting requirement.

Write for New Bulletin No. 601 Today!

Ask us also about COWLES

Max-Cut; Speciolloy; Superalloy; Circle C and Super C Slitting and Side Trimming Knives.

Spacers
Edging Rolls
Forming Rolls
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Scarfing Tools
Roll Turning Tools
Carbide Tipped Scrap Chopper Blades
Rotary Cut-off Knives

These tools illustrated and fully described in Catalog No. 561. Write for your copy Today!

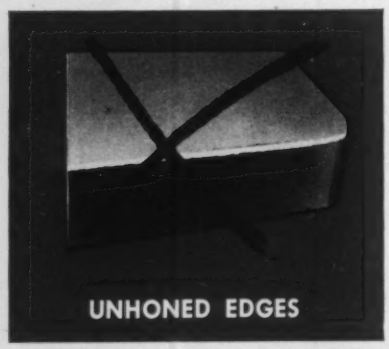
COWLES TOOL COMPANY
2086 WEST 110th STREET • CLEVELAND 2, OHIO

Metallurgical Memo from General Electric

GENERAL ELECTRIC ANNOUNCES PRE-HONED

Hand-honing is inaccurate, time-consuming—often results in premature chipping and breaking.

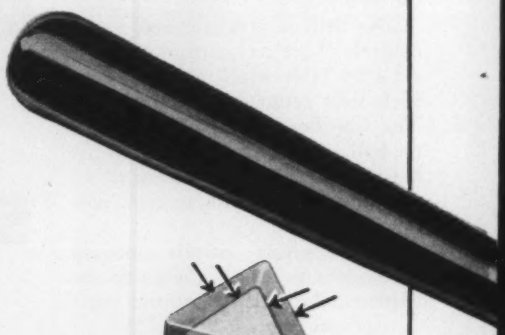
Chamfered, or ground-flat, edges are geometrically weaker than a radius and are more easily chipped or broken.



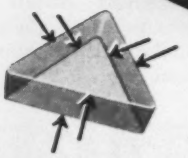
Unhoned or as-ground inserts show rough edges—result in unpredictable tool life due to chipping.

Now you get more predictable tool life... lower cost per cutting edge ... no hand-honing cost!

Pre-honed inserts with uniform, precise honed edges offer top strength; improve tool life predictability.



Additional savings result through the elimination of costly and often inaccurate hand-honing methods.



Because chipping and breaking are minimized, pre-honed Carboloy inserts result in lower average cost per cutting edge.

TOPS IN TOOLING QUALITY

From the research and quality-control facilities of the Metallurgical Products Department of General Electric comes the outstanding quality tooling line in the metalworking industry. The new Carboloy pre-honed inserts, as well as the complete line of Carboloy toolholders, inserts, insert seats, convertible seats, and brazed tooling, are designed to meet every tooling need efficiently and economically.

CARBOLOY® INSERTS

Delivered ready-to-use . . . honed to a precise radius . . . promise BETTER PROFITS THROUGH BETTER TOOLING

Now General Electric Carboloy inserts are pre-honed *at the factory!* Here's what it means to you:

1. An insert with edges honed to precise *radii* gives the strongest geometric shape to withstand cutting pressures. This reduces the chance of chipping—increases the predictability of tool life. Hand honing *cannot* achieve precise radii—G-E pre-honing can . . . and does!

2. Since chipping is minimized, fewer cutting edges are wasted. The result is lower cost per cutting edge.

3. Since inserts come pre-honed and ready-to-use, the labor cost and inaccuracies of hand honing are eliminated. This more than offsets the additional charge for pre-honing.

4. Pre-honed Carboloy cemented carbide inserts have standard edge radii honed to a greater or lesser degree, depending on the job to be done. You'll *know* the honing is right!

Ask your Authorized Carboloy Distributor about pre-honed Carboloy inserts, convertible seats, toolholders, and brazed tools. Or, write directly to: *Metallurgical Products Department of General Electric Company, 11141 E. 8 Mile Blvd., Detroit 32, Michigan.*

Shown here, both under magnification and graphically, is an edge of the new Carboloy pre-honed insert. Radius is geometrically ideal to minimize chipping, extend tool life many times.

CARBOLOY®
CEMENTED CARBIDES

METALLURGICAL PRODUCTS DEPARTMENT

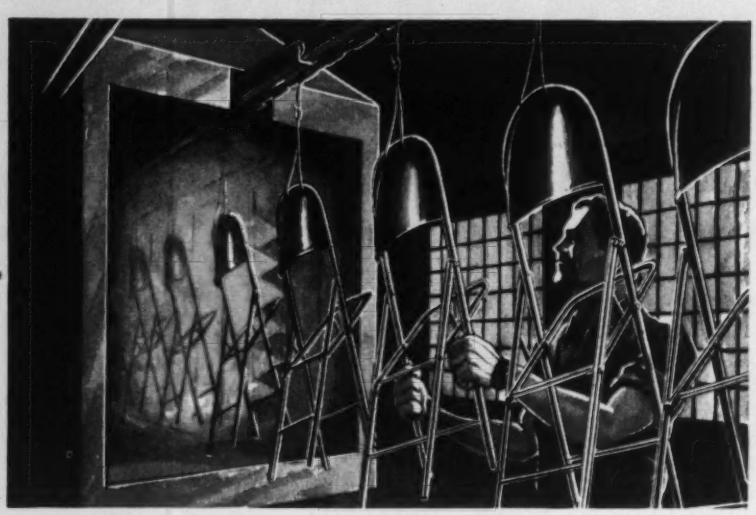
GENERAL ELECTRIC

CARBOLOY® CEMENTED CARBIDES • MAN-MADE DIAMONDS • MAGNETIC MATERIALS • THERMISTORS • THYRITE® • VACUUM-MELTED ALLOYS

For the best in pressure spray washing

ask Oakite

OVER 50 YEARS CLEANING EXPERIENCE • OVER 250 SERVICE MEN • OVER 160 MATERIALS



Even the highest spray washer pressures won't foam Oakite 161 alkaline detergent

Turn on the highest pressures to speed cleaning—you won't get any foaming problems with Oakite 161. Nor any etching problems, either. This alkaline detergent is specially designed for *safe* pressure spray washing of any metal—aluminum, white metals, brass, steel.

And it does a thorough job. Oakite 161 blasts off identification inks, grease, oil and shop soils . . . gives a completely clean surface for inspection or final finishing. Costly? Not at all. Extra long solution life and low concentrations assure low per-unit production costs.

One of a complete line of Oakite products for spray washers, Oakite 161 is complemented by heavy-duty solvent cleaners, moderate to light-duty alkaline materials. Ask the Oakite man to help you make the choice that's right for your washer . . . right for your products. Or send for Bulletin F-9773. Oakite Products, Inc., 24 Rector Street, New York 6, N. Y.

it PAYS to ask Oakite

OAKITE

over 50 Est. 1909 SCIENCE

years' leadership in industrial cleaning

NEW PRODUCTS and equipment

(*Concluded from Page* 135)

has a function selector (off, manual, and automatic) with separate start and emergency stop buttons. The six spindle turret drill and tap capacity is 1/4 in. in steel and table working area is 4 x 5 in.

For further information, *write* Burgmaster Corp., 15001 S. Figueroa St., Gardena, Calif.

Brushes Replaced Easily

EXTERNALLY removable brushes are featured in the Redmond fractional horsepower electric motors.

The brushes can be replaced quickly and easily.

For further information, *write* Redmond Co. Inc., Owosso, Mich.

Mold Release Agent Contains Silicone Fluid

TWO advantages of a silicone release agent for shell molding and shell core blowing are cited by the maker: 1. It's not necessary to pull the pattern from the machine on long runs. 2. Pattern cleanup time is reduced.

The material contains a high viscosity, GE silicone fluid dissolved in a petroleum solvent. It's suggested for applications where a silicone fluid in a prepared form is desired.

The solution (XS-4030) has a viscosity of about 5 centistokes and contains 5 per cent silicone. It can be applied by brushing, swabbing, or spraying.

For further information, *write* Silicone Products Dept., General Electric Co., Waterford, N. Y.

Another example of National Roll quality control

John Patton, National's assistant sales manager and Joe Marsalka, metallurgist, look over the reflectoscope "profile" of a steel roll.

No flaw escapes this electronic eye!

Your steel rolls from National are given a thorough examination by reflectoscope before shipment. Ultra-high frequency sound waves traverse every segment of the roll, electronically assuring the absence of internal flaws which might shorten the roll's service life in your stand.

This attention to detail and emphasis on high quality of product are two reasons why more and more steel makers are turning to National for their steel, iron and nodular iron rolls. From the moment you call a National representative, your roll problem gets the *personalized* attention of men experienced in analysis, design and production.

We'd like to tell you more about how National Roll's expanded staff and facilities can serve you. Next best thing to a visit with us is a look at our new brochure. May we send you a copy? It helps explain why . . .

National's the growing name in rolls

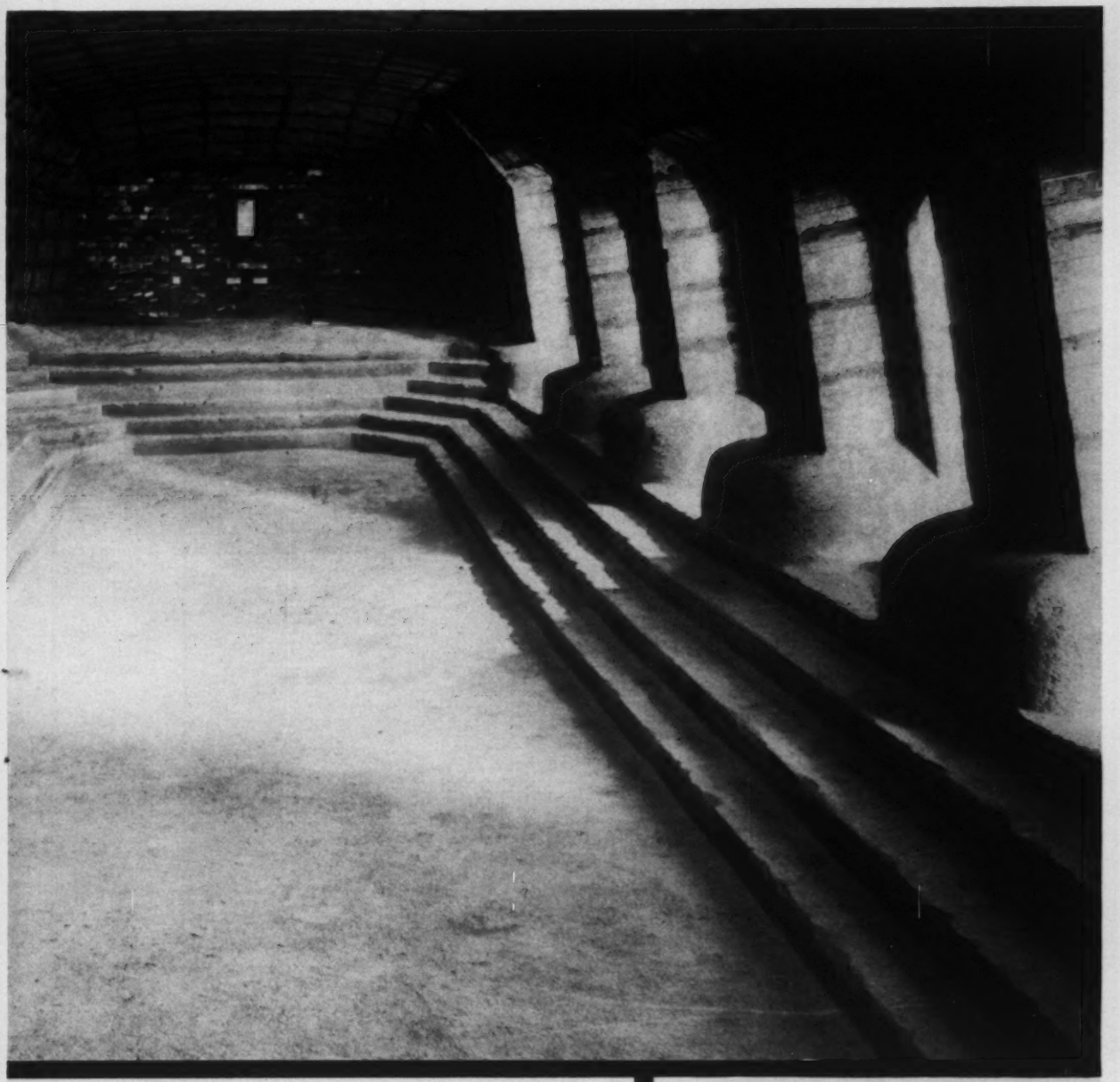
NATIONAL ROLL & FOUNDRY DIVISION

GENERAL STEEL CASTINGS CORPORATION, Avonmore (Westmoreland County), Pa.

General Steel Castings Corporation, General Offices: Granite City, Illinois • Plants: Granite City, Ill., Eddystone, Pa., Avonmore, Pa.

PERMANENTE 165 BOTTOM HELPS MAKE THIS AMERICA'S MOST MODERN O.H. FURNACE!

The furnace shown here is the recently completed number 5 Open Hearth at Keystone Steel & Wire Company, Peoria, Illinois. ● IT IS AN ALL-BASIC FURNACE, the first of its type ever to be built in the U.S. ● Keystone has established since 1954 a successful record of using basic refractories to redesign furnaces for greater capacity and efficiency. Their last of four conversions to all-basic was made in 1957, to add 80,000 tons to the annual production. Now, the new number 5 furnace adds 120,000 more and pioneers furnace design with methods proved best in six years of experience! ● Experience has proved that Permanente 165 Ramming Mix makes a bottom that lasts



significantly longer than other materials... requires fewer repairs and less down time... helps produce greater tonnage at lower bottom cost. ● Permanente 165 is made from high purity Kaiser Periclase refractory grains (94-96% MgO) and ceramically bonds itself into a crystalline mass at relatively low temperatures. This produces a bottom with maximum resistance to hydration and attack by iron oxide and slag. Its installed high density—averaging 175 pounds per cubic foot—assures longer life. ● Ask your Kaiser Refractories sales representative to show you how this superior ramming mix can help you get greater steel tonnage at lower bottom cost.

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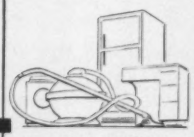

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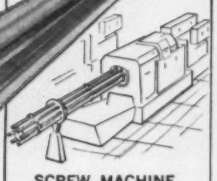

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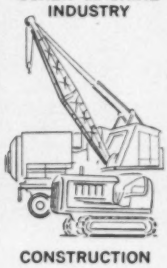

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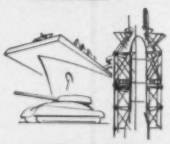

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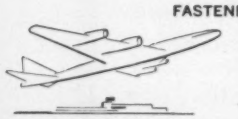

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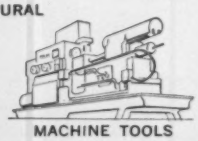
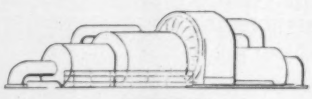


MACHINE TOOLS



ELECTRICAL

NEW literature

Write directly to the company for a copy

Pallet Handling

A booklet, "ABC of Pallet Handling," shows different types of pallets and explains their uses. Suggestions are offered for safe pallet operations. Raymond Corp., 91-184 Madison St., Greene, N. Y.

Silicone Rubber

A 12 page bulletin carries suggestions for handling room temperature vulcanizing (RTV) silicone rubber compounds and discusses curing and viscosity characteristics. Information is given about RTV primers for bonding applications. Silicone Products Dept., General Electric Co., Waterford, N. Y.

Automatic Fusion Welding

Applications of developments in highly precise, automatic fusion welding are discussed in a 27 page report. The report includes applications in North American Aviation's B-70 program, Raytheon's Hawk processing, and others. Dept. F-W-1, Sciaky Bros. Inc., 4915 W. 67th St., Chicago, Ill.

Rare Earths

Data sheets discuss catalytic properties of rare earths. Vitro Chemical Co., 342 Madison Ave., New York 17, N. Y.

Iron & Steel Board

A 31 page booklet discusses England's Iron & Steel Board. The discussion includes a historical background, several pages on costs and prices, and trade practices and competitive conditions. Iron & Steel Board, Norfolk House, St. James's Square, London, S.W. 1, England.

Iron-Carbon Diagram

An 8½ x 11 in. version of Tempil°'s "Basic Guide to Ferrous Metallurgy" uses chart style to show metallurgical phases related to temperature. Tempil° Corp., 132 W. 22nd St., New York 11, N. Y.

Scrap and Our Resources

A pamphlet discusses how use of iron and steel scrap helps reduce waste of vital natural resources. Ask for "Scrap and Conservation of Natural Resources." Institute of Scrap Iron & Steel Inc., 1729 H St. N.W., Washington 6, D. C.

Water Hardness Analysis

Described in a two page data sheet is a method for continuous, automatic analysis of water hardness. Technicon Controls Inc., Research Park, Chauncey, N. Y.

Technical Report Series

Report No. 1 in a continuing series is entitled "Emissivity Enhancement of Solar Cells for Temperature Control." Charts and diagrams supplement the text. Military Products Div., Bausch & Lomb Inc., Rochester 2, N. Y.

Unmasked...

the true story of motor insulation

The selection of insulation materials—and the methods of their application—are basic factors in the performance of every electric motor. Yet their true significance has escaped many motor buyers . . . hidden by a mask of tricky trade names and claims for "cure all" insulations that simply do not exist.

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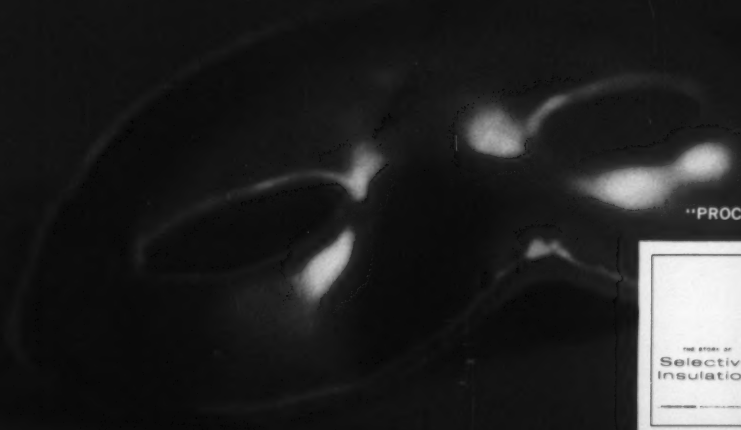

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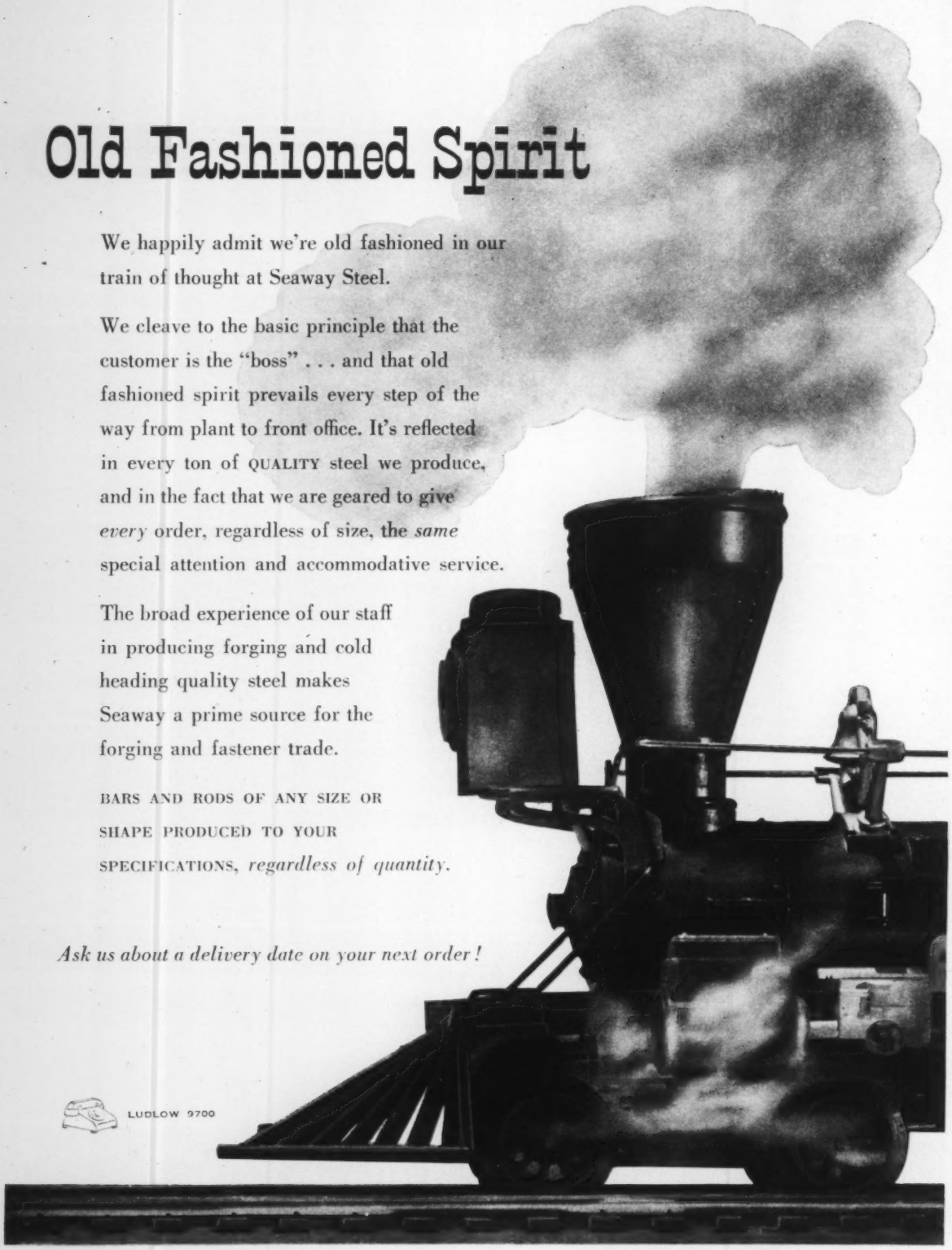

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Auto Needs Pace Steel Pickup

CONDITIONS in the steel markets are a little brighter than they were a month ago. Buying is picking up slowly, but steadily, notably on automotive account, and there are a few signs of quickening activity in other directions. However, new order volume is still falling short of seasonal expectations, and it looks as if October may not attain its traditional position as a peak steel production month this year.

SEASONAL PICKUP—About the best that can be said is that seasonal consuming requirements are boosting order volume slowly; further gains are likely next month as the metalworking industries (principally the automotive and appliance trades) get squared away for fourth quarter production campaigns.

AUTOMOTIVE GAINS—The most active steel buying is being done by the automotive industry. It is ordering more steel steadily. However, it is buying at a much later time of the year than normally and in smaller lots.

PICKUP REPORTED—An encouraging note is provided by the steel distributors who report gains in shipments for the first time this year. Their August tonnage was 3 to 5 per cent better than July's; improvements were particularly noticeable the last ten days of August, and the uptrend continued into September. The showing varies by trading area, product line, and company, but, says Robert G. Welch, executive vice president, Steel Service Center Institute: The uptrend is definitely underway. Steel service center shipments in the first eight months of this year were about 25 per cent under those in the like 1959 period. But 1959 shipments were record breaking because of the steel strike.

STEEL OUTPUT UP—Settlement of the strikes on the Pennsylvania Railroad and interplant roads of U. S. Steel is clearing away some traffic jams that have been hampering steel production and shipments. Some steelmen think output will show an impressive rise in fourth quarter. Last week, the national ingot rate went up almost a full percentage point to 53.9 per cent (1,537,000 net tons of ingots). That compares with 1,510,000 net tons the previous week.

RECORD GOOD—Despite current sluggishness, steelmakers insist 1960 will go down in the records as one of the better production years. They point out that ingot output in the first eight months totaled 73.9 million tons, with operations averaging 74.4 per cent (based on 1960 rated capacity of 148.5 million tons). It's estimated that output for the year will exceed 106 million tons, which means average operations of about 71 per cent. In record 1955, it would have taken an operating rate of 84 per cent to produce that much steel. Capacity then was 125.8 million tons. That year, the industry operated at 93 per cent of capacity in turning out 117 million tons.

SCRAP SLUGGISH—There isn't enough new domestic business coming out to provide a thorough test of published scrap prices. In the absence of active trading, prices are based largely on brokers' and dealers' views of the market. Last week, STEEL's composite on No. 1 heavy melting slipped another 33 cents a ton to $32. The market continues to get support from exports. Last week, Japan closed on about 560,000 tons for shipment during the fourth quarter.

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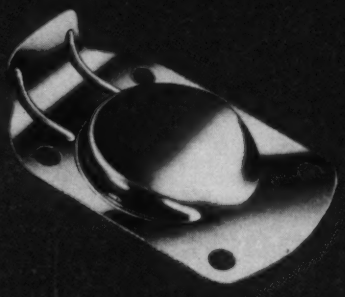
*Current prices were published in the Sept. 19 issue and will appear in subsequent issues.

you can blank it...



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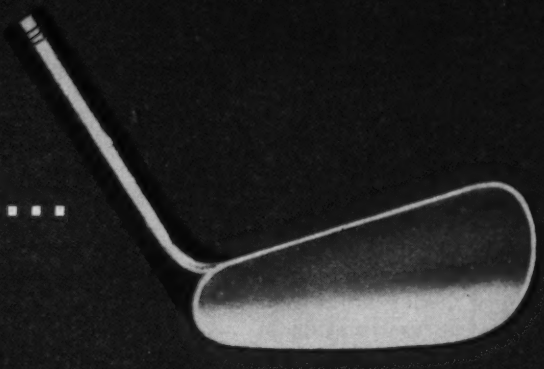

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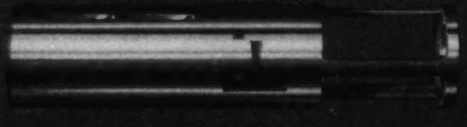

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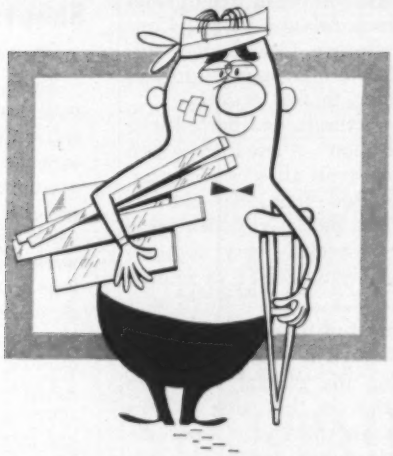
Tool Steelmakers



Battered but Unbowed

SENSITIVE to every swell in the economic cycle, the tool steel industry is skipping along a broad trough, awaiting its chance to ride the next crest.

The rush to replenish inventories after last year's steel strike built up enough momentum to carry well into 1960.

Beginning with September, 1959, the American Iron & Steel Institute reported monthly shipments above the 9000 ton level. Shipments continued to climb and reached a peak of 10,362 tons in March, 1960. In April, 8098 tons were shipped, the amount decreasing each subsequent month, sharply dropping to 4684 tons in July.

• **Sales Below Expectations**—Total net tons shipped in the first seven months of 1960 were 94.5 per cent of the total for the corresponding 1959 period. Sales performances by the producers confirm this in the main:

Crucible Steel Co. of America, Pittsburgh, reports tool steel sales for the first half of 1960 were about the same as for the 1959 period.

Sales for the first half at Allegheny Ludlum Steel Corp., and Firth Sterling Inc., Pittsburgh, and Vulcan-Kidd Steel Div., H. K. Porter Company Inc., Aliquippa, Pa., averaged about 10 per cent below the year ago period.

Simonds Saw & Steel Co., Lockport, N. Y., tallied an increase of 9.5 per cent during the first half over the 1959 period, which it credits to heavy ordering after the steel strike. In comparing totals for the first eight months of each year, says the firm, sales were even, reflecting the softening effect that has existed the last four months.

• **Demand Varies**—Sales of every grade have been losing ground. Sales have declined about 44 per cent from the March peak for high speed tool steels, about 66 per cent for the water hardening grades, and about 50 per cent for the others.

Simonds and Crucible corroborate the relative sustained activity for high speed tool steels. Allegheny Ludlum feels that hot work tool steel is getting more play. The others report that there is no significant pattern, though one producer claims an increase in the demand for air hardening grades.

• **Boost in Sales Predicted**—Producers unanimously forecast increasing sales in the next six months. Firth Sterling specifically sees a 10 per cent increase. Simonds estimates that sales will be above 1960's second and third quarters but below the high first quarter. Crucible and others predict that second half totals will match the first.

The collective reasoning for the increase is reflected in this comment by Simonds' sales manager, C. H. Emery: The relative stability of consumer buying would indicate that production tooling and consequently inventory stock will have to be replaced.

• **Look to Autodom** — The most outstanding market for tool steel is still the automotive industry, says one producer; another lists automotive, fasteners, and independent die shops in that order. Allegheny Ludlum reports that tool steel for aircraft structurals has been active.

Industry's hopes for increased sales rely partially on Detroit. As one producer puts it: One factor that could be a deterrent might be a reversal in Detroit of a "planned obsolescence" attitude as indicated and partially adopted by American Motors.

• **Markets Explored**—New markets are being sought. One reason is overcapacity—potential annual capacity (finished forms) is 300,000 tons. Production reached a postwar peak of 181,836 tons in 1951; total net shipments for 1959 were 96,059 tons.

Other factors: Traditional markets are close to saturation, imports are mounting, and competition is growing from new forming meth-

ods, carbides, plastics, and ceramics.

Most new applications are being found in nontooling areas. The aircraft and missile industry is using the material (mostly hot work tool steel) for rocket motor cases, landing gear components, and airframe supports.

Crucible has developed uses for tool steel in the power steering equipment for cars and for high temperature bearings in jet engines. There is a definite trend to apply the material where higher hardness, higher heat resistance, and longer wearing properties are required.

● **Imports**—The reaction in the industry to imports is mixed. One of the major producers dismisses the importance of the threat. All feel that at the moment imports are affecting only a narrow, isolated segment of the market, but they're apprehensive about the future.

Figures cited by James P. Hill, chairman, Vanadium-Alloys Steel Co., Latrobe, Pa., show that imports hit 4.6 million lb during the first four months of 1960 vs. 6.5 million lb for all of 1959.

Firth Sterling cites low prices, made possible by low labor costs, as the primary factor in the growth of foreign tool steel.

Stocks of Imported Steel Present Threat on Coast

An increase in ocean freight rates of the North Atlantic Freight Conference, effective Oct. 1, has stiffened prices on Western European steel moving to this country.

Bars, structurals, and barbed wire are up $2 a ton. A few items which have been weak all along are unchanged. Two other items—furring channels and nails—on which prices have been especially easy, continue downward, being off $1 or more a ton.

The threat of unsold foreign steel held in storage at West Coast ports is affecting the general steel market situation in that area. Price schedules are being cut, and district steel service center operators say that until the foreign tonnage is pretty well liquidated, the market will continue unstabilized.

At Houston on the Gulf Coast, imports of steel in August totaled 16,000 tons, the lowest amount to be received at that port in more than two years. Imports were 25,000 tons in the preceding month, and in August, 1959, they came to 52,000 tons. The sharp decline this year is attributed to slow business.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 158 & 159

Sheet steel buying continues to inch upward, but most orders are still on a hand-to-mouth basis, and tonnage is readily available for prompt shipment. Hot rolled sheets can be had within one to three weeks, cold rolled within two to five weeks, and galvanized in three to four weeks. Sheet specialties, such as electrical and enameling stock, can be had for shipment within a month.

Consumers, generally, are still chewing up more sheets than they are buying, and, apart from some fill-in purchases, they are showing little disposition to build up inventories.

The most active buyer today is the automotive industry. It is tak-

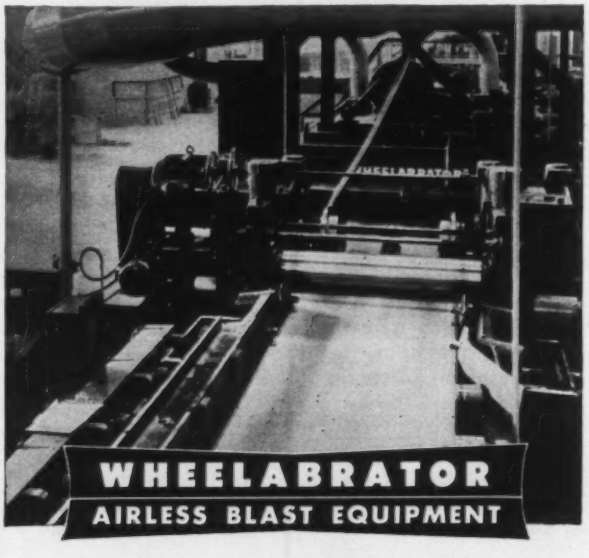
EXECUTIVE REPORT #12

A PIPE DREAM COMES TRUE

Wheelabrator® cleans skelp edges at new low cost

Another example of steel industry savings made possible by Wheelabrator mechanical descaling is the exceptional economy realized by pipe rolling mills in cleaning of skelp. Here it is desired to clean only a small strip along both edges of the bottom side of the skelp, which will be butted together and electro-welded.

In the Wheelabrator process, two blasting wheels are positioned to pinpoint their abrasive barrage along the edges, giving fast, thorough cleaning of these surfaces only.



Wheelabrator leads in mechanizing steel mill descaling methods

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ing more tonnage than any other line, but it is entering orders on mill books much later than normal for this season. There is a certain amount of marking time, attributed generally to the desire of the carbuilders to reduce their stocks of 1960 model cars.

Shipment Gain Reported By Steel Distributors

Shipments of industrial steel products by the steel service centers gained for the first time this year during August. That's what a survey by the Steel Service Center Institute shows. Robert G. Welch, executive vice president, thinks the modest uptrend may be a signal of firmer sales to the metalworking industry this fall.

The survey showed that while service center shipments in the first eight months this year were about 25 per cent below those in 1959, they are now running somewhat above the 1958 rate. Shipments in 1959 were record breaking, largely because of the steel strike. Distributors' shipments in August this year showed a 3 to 5 per cent increase over those the preceding month, and the gain extended into September.

The recent shipment showing varies by trading area, product line, and individual company, but Mr. Welch says the uptrend is definite. He says, reduced customer inventories, relaxed interest rates, and a pickup in expenditures for government projects were among the factors more frequently mentioned by the institute's members as contributing to better business conditions.

The distributors' spokesman said the industry was facing a serious earnings problem. Average order size has declined steadily since the first of this year, order processing costs have gone up, and lower prices have contributed to sharply reduced profit margins.

Employment has been reduced in the steel distributing industry by not replacing workers that retire or leave, and labor saving equipment has been added on an extensive basis. Such cost reductions, however, have not been sufficient to compensate for lower earnings due to reduced tonnage shipments and profit margins.

Distributor inventories have been reduced to 3.4 million net tons, and some operators think stocks can be cut to 3.3 million tons and still allow the industry to meet customers' requirements.

Plates . . .

Plate Prices, Page 187

The outlook is a trifle better in the plate market. The Harrisburg, Pa., producer has resumed operations after a suspension of two weeks, and operations elsewhere are up slightly. However, Republic Steel's mill at Gadsden, Ala., has been temporarily halted to permit installation of new equipment.

Prospects for shipwork have been enhanced by the likelihood of early placing of 15 cargo ships by the Maritime Commission. In addition, Sun Ship Building & Dry Dock Co., Chester, Pa., is inquiring for 9000 tons of plates and shapes for a new drydock. Some Naval shipyard work is before the market. The Navy Yard at Portsmouth, N. H., closes Oct. 7 on substantial plate

"All exposed and unexposed surfaces shall be of STAINLESS STEEL..."

Cafeteria and Executive Kitchen, *Continental Grain Co.*, Offices, New York City. Designed by *Designs for Business, Inc.*, New York, N. Y. Fabricated by *Stainless Food Equipment* Co., Newark, N. J. Installed by *Ben Mernit*, New York City

■ The specifications for this executive cafeteria called for all kitchen metal surfaces, both exposed *and* unexposed, to be constructed of stainless steel. Only *lifetime* stainless steel can offer the durability and ease of maintenance necessary for maximum sanitation in food handling.

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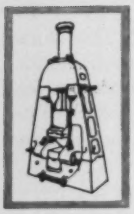

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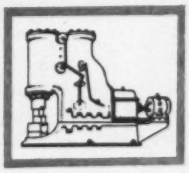
An air-operated impact drop stamp that produces a controlled blow or a "squeeze" instantly, at the will of the operator. Gives a permanent set to all the formable metals—even high strength alloys. Popular in iron foundries as inexpensive, highly productive tool for restriking malleable castings. Sizes from 21" x 18" platen area to 120" x 120" platen area. Ask for Bulletin No. 30-L-5.

STEAM DROP HAMMER

Designed to produce forgings at lowest cost per piece. Unique differential porting on Model "E" makes for the most efficient use of steam or air—greatest economy of power. Unusual strength and rigidity reduces down time, maintains alignment, increases production. Sizes 1000 lbs. to 16,000 lbs. Ask for Bulletin No. 55-L-4.

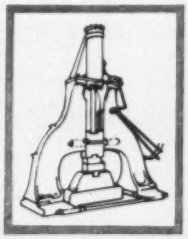


PNEUMATIC HAMMER

Popular motor-driven hammer with self-contained compressor, for flat-die or blacksmithing operations. Ideal for tool dressing, for research laboratory work, etc. An exceptional forging tool, independent of steam or air lines. Sizes 200 lbs. to 5000 lbs. Ask for Bulletin No. 16-L-9.

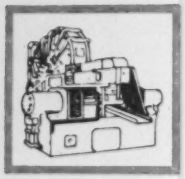
SINGLE FRAME HAMMER

High frame provides greater working space. Specially designed forged alloy steel dies ease stock manipulation. Power-saving cylinder cuts operating costs. Preferred for forging large discs and rings, upsetting high stems, etc. Ram guides supported on 5 sides. Sizes 750 lbs. to 6000 lbs. "Power/trol" power-assist controls on 2500 lb. hammers and larger. Ask for Bulletin No. 1-L-4.



DOUBLE FRAME HAMMER

Large working space for special or routine jobs. Well suited for making large rings, cogging and drawing out toughest alloy steels and high temperature "exotic" metals, making large axle forgings, etc. Heavy 15:1 anvil increases blow effectiveness. Sizes 2000 lbs. to 24,000 lbs. "Power/trol" power-assist controls on 3000 lb. hammers and larger. Ask for Bulletin No. 74-L-7.



THE IMPACTER & CECOMATIC FORGING

The revolutionary Chambersburg Impacter forges by means of horizontally-opposed rams striking the stock simultaneously from both sides. This new concept of the forging process makes possible the continuous, automatic production of drop forgings. Fully described in Bulletin No. 87-L-9.

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CHAMBERSBURG ENGINEERING CO.

CHAMBERSBURG • PENNSYLVANIA

When it's a vital part, design it to be FORGED

tonnage, including 2504 tons of high tensile alloy.

Big Farm Equipment Firm Plans Temporary Closings

International Harvester Co. has announced temporary closings for ten of its 13 plants. Six are in the farm equipment field and three in construction equipment. Affected will be an estimated 16,500 to 17,000 employees.

Company spokesmen say poor weather, which restricted farm and construction work earlier this year, is responsible for the shutdowns. They said business has been disappointing this year, and the company's manufacturing schedules for the next fiscal year beginning Nov. 1 are light. It's a case of having more inventory than needed. The closings are staggered between Oct. 3 and Dec. 5.

So far as known, other manufacturers of farm machinery and construction machinery are not planning similar action.

Tin Plate . . .

Tin Plate Prices, Page 159

Granite City Steel Co., Granite City, Ill., will produce standard and thin gages of tin plate on a 6400 hp Sendzimir cold strip mill. It will go into production in the second quarter of 1961, says N. P. Veeder, chairman and president. The mill was designed by Waterbury Farrel Foundry & Machine Co., a division of Textron Inc., Waterbury, Conn. The mill will handle wide, cold rolled sheets at speeds up to 3500 fpm.

Steel Bars . . .

Bar Prices, Page 157

Demand for hot rolled carbon steel bars is fairly well diversified, but order volume is little improved from that a month ago. Mill shipment promises still average two to three weeks. Practically all buying is for nearby delivery. Occasionally, orders are received for shipment as late as December, but they are exceptional.

Cold drawn bar producers have a wide assortment of sizes available for quick shipment. Some converters are having difficulty getting in enough business to support half capacity operations. The availability

of quick shipments (often from stocks) makes it unnecessary for consumers to order far ahead.

Tubular Goods . . .

Tubular Goods Prices, Page 161

Welded pipe requirements have provided fair demand for plates the last few weeks, but this business seems to be subsiding.

A little pickup in activity is reported in the cast iron pipe trade. Many new inquiries are reported developing in the Pacific Northwest. The largest job there involves 1183 tons of 8, 18, and 24 in. for Wenatchee, Wash., on which bids close Sept. 26.

Canada's Iron, Steel Output Declined in August

Canada's iron and steel production during August touched the lowest monthly rate since the start of 1959. Production of steel ingots amounted to 425,327 tons, a daily average of 74.5 per cent of capacity. It compares with 435,336 tons, or 76.2 per cent, in July.

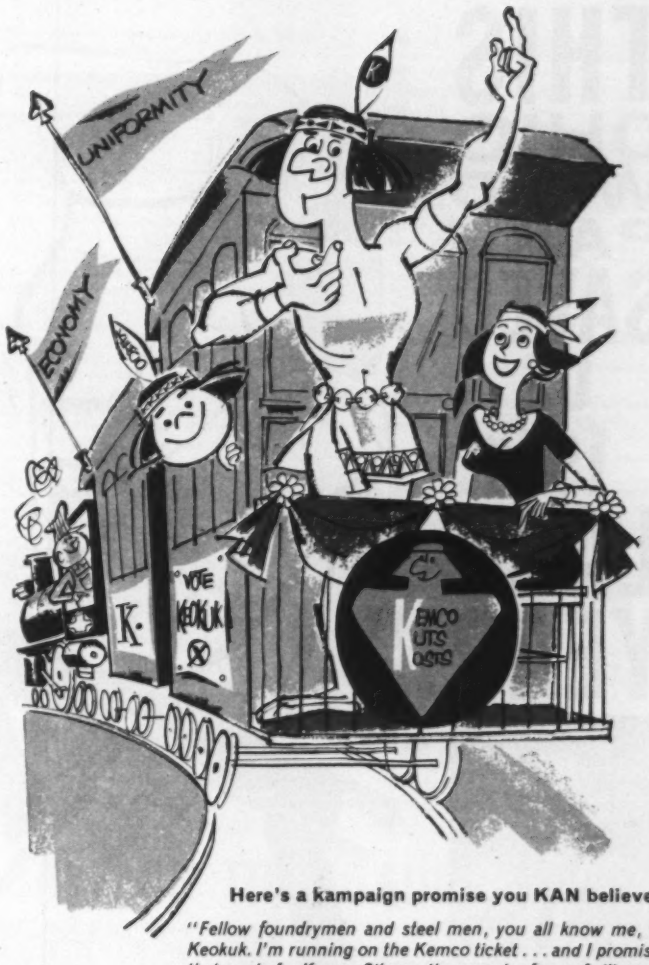
For the eight months ended August, production of steel ingots totaled 3,981,423 tons vs. 3,727,011 in the like 1959 period.

Pig iron production during the month was 329,805 tons vs. 337,018 in July. For the first eight months this year, output was 2,941,586 tons vs. 2,734,406 in the like period last year.

Prices Again Reduced On Nylon Tubular Bars

Prices on nylon tubular bars have been reduced for the second time since February by Polymer Corp., Reading, Pa. Reductions range up to 30 per cent. Last February, cuts of up to 50 per cent were made on some sizes with the introduction of Polymer's MC Nylon formulation.

The material has gained acceptance for large bearings, rollers for paper or textile processing, wear plates and panels, tooling and fixtures. The bars are produced in outside diameters ranging from 2 to 15 in. Wall thicknesses of 3/8 in., 1/2 in., 3/4 in., and 1 in. are standard; thicknesses up to 2 in. are available.



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*"Fellow foundrymen and steel men, you all know me, Chief Keokuk. I'm running on the Kemco ticket . . . and I promise you that a vote for Kemco Silvery, the superior form of silicon introduction, is a vote for quality and economy. The record speaks for itself, my friends, so when you vote for Silicon . . . vote for KEMCO!"**

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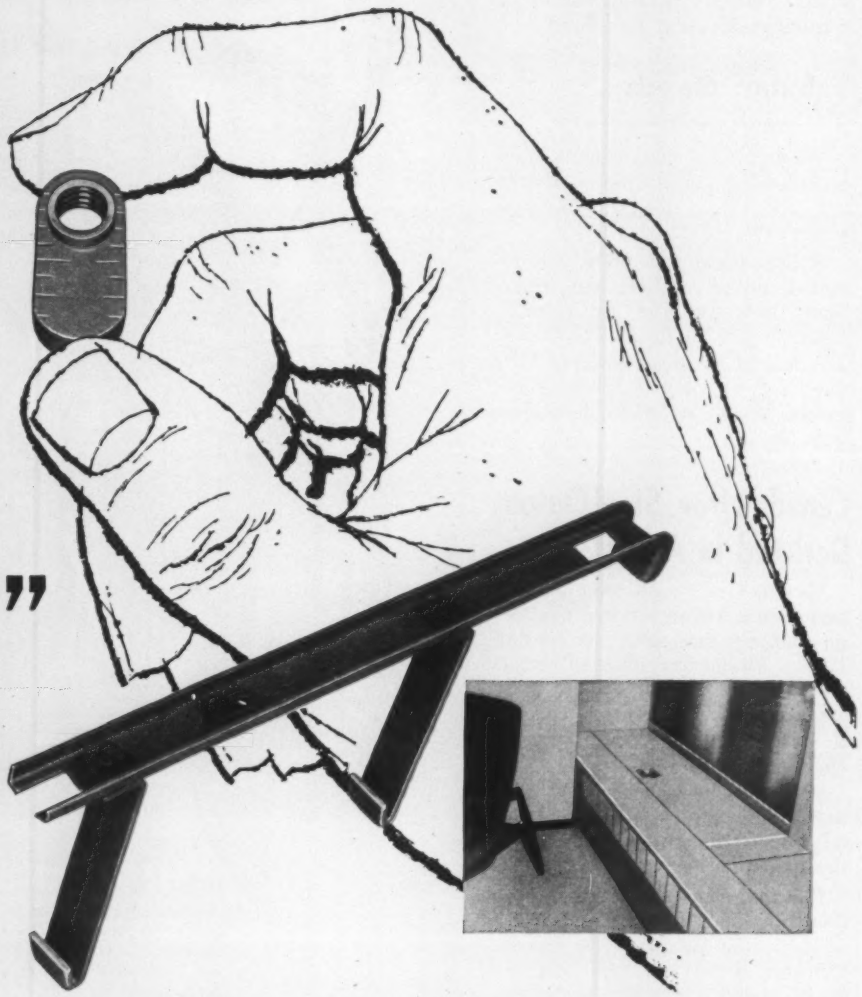
**Wear a Chief Keokuk campaign button! Write Campaign Managers Princess Wenatchee and Junior at Keokuk for your button . . . a supply if you wish.*

"THIS OHIO WELD PART SAVED US 19% LAST YEAR!"

reports Milton M. Brooks,
General Manager of
SLANT FIN Radiator Corp.



The ***Slant/Fin*** Radiator Corporation of Richmond Hills, New York, introduced new economy and efficiency into the manufacture of their residential and commercial fin type radiators when they switched from clip type nuts on the mounting brackets to Ohio XN Spotweld Nuts.

The savings on per piece cost alone amounted to approximately $2,500 last year, but this is only part of the story. Since the bracket assembly was joined by spotwelding, the XN nuts are attached in the same operation. The clip nuts formerly used required additional handling.

Ohio XN nuts are specially designed to be spotwelded in place with the same settings used to join assemblies and can be welded with even light, portable resistance welding equipment.

Welding is made foolproof by a recessed target area the beveled sides of which guide the electrode in position for an optimum weld. Once welded they're there to stay. Subsequent assembly is fast and easy because there is no need to hold them as mating parts are attached. Since they are integral parts of the component to which they're welded, fastener failure is all but eliminated.

If you have never considered the use of weld parts . . . nuts, screws, pins, pads or special purpose parts . . . you may be overlooking an opportunity to reduce your costs, improve your product and increase your profits. Write today for your free Ohio Nut and Bolt Catalog. Some of the applications shown in this 50-page combination stock parts catalog and welding manual may spark an idea that can help your company cut manufacturing costs while improving product quality.

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WELD FASTENERS

Pioneering in Better Fastening Methods since 1905

THE OHIO NUT & BOLT COMPANY

THE PRIMARY FASTENER IN FASTENER ASSEMBLIES

BEREA (a suburb of Cleveland) **OHIO**

Structural Shapes . . .

Structural Shape Prices, Page 157

Following a recent flurry, structural steel demand appears to be lagging again. Various projects are on drawing boards, but active inquiry is spotty. Highway work is still outstanding in the market. Fabricators are eating into their backlogs and are competing sharply for new jobs.

Fabricators are buying wide flange beams in slightly heavier volume to meet bridge requirements. Demand for standard shapes continues slow. Estimated (but unplaced) tonnage in New England is made up substantially of wide flange structurals.

Contributing to delays in awards to fabricating shops is slowness in confirming contracts to low bidders. Most shops are not placing orders for new steel tonnage until they have firm contracts.

Isaacson Iron Works, Seattle, has been awarded 850 tons of shapes for Tacoma's Mayfield Dam powerhouse. An additional 300 tons will be required for the Washington State Mayfield bridge.

Highway construction costs have climbed sharply in California. The state's cost index has gone up 14.5 per cent since Mar. 31, 1960. The number of bidders per project on all projects in the last quarter dropped from 7.5 to 5.8, while on 20 projects of more than $1 million each, the average number of bidders declined from 10.5 to 6.5.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5750 tons, bridge-tunnel, Chesapeake Bay, Maryland, to American Bridge Div., U. S. Steel Corp., Pittsburgh.

850 tons, Tacoma's Mayfield power project, to Isaacson Iron Works, Seattle.

650 tons, Public School No. 84, New York; Caristo Construction Co., New York, low on the general contract.

600 tons, state highway structures, Tewksbury-Andover, Mass., to City Iron Works Inc., Wethersfield, Conn.; Suburban Excavators Inc., Wakefield, Mass., general contractor.

325 tons, junior and senior high school, Worcester Township, Pennsylvania, through D. B. Van Campen Corp., Philadelphia, to the Trojan Steel Co.

323 tons, regional high school, Bolton, Mass., to United Structural Steel Co., Worcester, Mass.; Innamorati Bros. Inc., Clinton, Mass., general contractor; 71 tons, reinforcing bars to Barker Steel Co., Boston.

205 tons, extension, building 64, Rohm & Haas Co., at Bristol, Pa., to the Robinson Steel Co., Philadelphia.

200 tons or more, Multnomah County Freeway, Portland, Oreg., to unstated interest; Peter Kiewit Sons Co., general contractor.

120 tons, manufacturing building, Quakertown, Pa., through Robert E. Lamb Inc., Philadelphia, general contractor, to Morris Wheeler & Co., Philadelphia.

STRUCTURAL STEEL PENDING

8000 tons, Lewiston-Queenston arch span bridge over the Niagara River, for Niagara Falls Bridge Commission, Niagara Falls, N. Y.

2900 tons, towers and approach work, Broadway Bridge, New York, Department of Public Works, bids Oct. 11.

2000 tons, Bell Telephone Exchange, Philadelphia; also 550 tons of reinforcing bars required.

1978 tons, state highway bridge, Ulster County, New York, John Arborio Inc., Poughkeepsie, N. Y., general contractor.

1450 tons, Cold Spring Lane interchange for the Maryland State Road Commission; Wright Contracting Corp., Baltimore, low on the general contract.

370 tons, Montana State, Reed Point highway bridge; bids to Helena, Mont., Sept. 28.

300 tons, Washington State, Mayfield Bridge; general contract to Puget Sound Bridge & Drydock Co., Seattle, low at $810,781.

220 tons, state bridgework, LR 790 (2B), Lackawanna County, Pennsylvania, withdrawn in favor of prestressed concrete, Bero Construction Co., Waterloo, N. Y., general contractor.

200 tons, Montana State bridge at Helena; bids to Helena Sept. 25.

125 tons, state highway bridge, Woolwich, Maine; bids Oct. 5 to Augusta, Maine.

117 tons, state bridgework, Allegheny County, New York; bids Sept. 21.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, Hebrew Home for Aged, West Roxbury District, Boston, to Bethlehem Steel Co., Bethlehem, Pa.; Tornabene Bros. Co., Newton Upper Falls, Mass., general contractor; structurals to Groisser & Shlager Iron Works, Somerville, Mass.

500 tons or more, U. S. Army hospital buildings, Ft. Eustis, Va., to Hall-Hodges Co., Norfolk, Va.; Virginia Engineering Co., Newport News, Va., general contractor.

260 tons, state highway bridges, Andover-Tewksbury, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Suburban Excavators Inc., Wakefield, Mass., general contractor.

140 tons, solid physics laboratory, Hanscomb Field, Bedford, Mass., to Joseph T. Ryerson & Son Inc., Boston; Poorvu Construction Co., Wellesley Hills, Mass., general contractor; structurals to American Architectural Iron Works, Boston.

REINFORCING BARS PENDING

720 tons, state bridgework, Middlesex County, New Jersey.

640 tons, Washington State, Mayfield Bridge, Lewis County; general contract to Puget Sound Bridge & Drydock Co., Seattle.

550 tons, Bell Telephone Exchange, Philadelphia.

200 tons, Washington State, highway bridge, King County; general contract to J. J. Welcome Construction Co., Redmond, Wash., low at $1,076,912.

125 tons, Simpson Logging Co., building, Everett, Wash.; general contract placed.

120 tons, Washington State highway projects, Benton and Okanogan counties; bids to Olympia, Wash., Sept. 27.

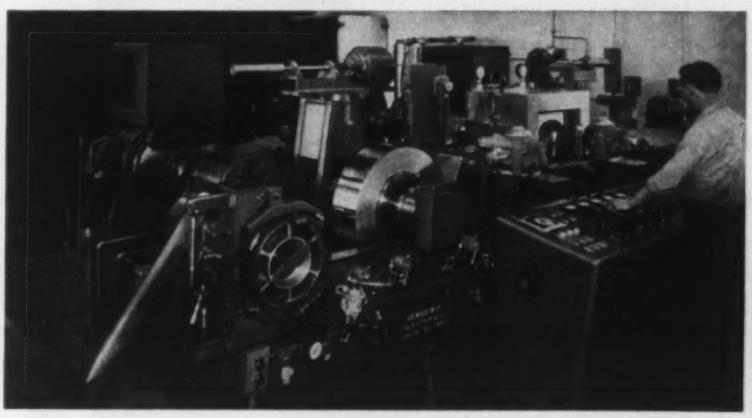
100 tons or more, two Washington State bridges, Lincoln County; Charles A. Power, Spokane, Wash., general contractor, low at $73,042.

PLATES . . .

PLATES PLACED

865 tons, Navy, General Stores Supply Office,

SAVE ON THIN GAUGE STRIP



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WALLINGFORD, CONNECTICUT

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Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa.

558 tons, Navy, General Stores Supply Office, Philadelphia, to C. Itoh & Co. (America) Inc., New York.

527 tons, Navy, General Stores Supply Office, Philadelphia, to C. Itoh & Co. (America) Inc., New York.

200 tons, steel water reservoir, for Olympia, Wash., to Graver Tank & Mfg. Co., Salt Lake City, Utah, at $70,546.

168 tons, Navy, General Stores Supply Office, Philadelphia, to Lukens Steel Co., Coatesville, Pa.

PLATES PENDING

9000 tons, including about 2250 tons of shapes, drydock, Sun Ship Building & Dry Dock Co., Chester, Pa.; bids asked.

2504 tons, high tensile, grade Hy-80, supply officer, Naval shipyard, Portsmouth, N. H.; bids Oct. 7.

600 tons, two oceanographic research ships; bids Oct. 31, Chief, Bureau of Ships, U. S. Navy, Washington.

300 tons, two tanks, Naval Air Station, Lemoore, Calif.; bids Oct. 5.

100 tons, steel service barge, deckhouse and buoy handling device; bids Oct. 7, U. S. Engineer, St. Louis.

PIPE . . .

CAST IRON PIPE PLACED

250 tons, various sizes, Midway, Seattle, and Tacoma, Wash., projects, to U. S. Pipe & Foundry Co., Seattle.

200 tons, various sizes, Seattle subway, Yakima and Tacoma projects, to Pacific States Cast Iron Pipe Co., Seattle.

180 tons, two projects at Tacoma, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

128 tons, 8 in. for King County District No. 93, to U. S. Pipe & Foundry Co., Seattle.

100 tons, miscellaneous, including tonnage for Chehalis, Wash., 4 to 8 in., to Pacific States Cast Iron Pipe Co., Seattle.

CAST IRON PIPE PENDING

1183 tons, 8, 16, and 24 in., system expansion; bids to Wenatchee, Wash., Sept. 26.

RAILS, CARS . . .

RAILROAD CARS PLACED

Louisville & Nashville, 400 boxcars, to St. Louis plant of American Car & Foundry Div., ACF Industries.

Trailer Train Co., 500 piggyback cars, to ACF Industries, Pullman Inc., and Bethlehem Steel Co. participating in the distribution.

American Cyanamid Co., one hundred 10,000 gallon rubber lined, and thirty-five 10,000 gallon aluminum tankcars, to General American Transportation Corp., Chicago.

Union Carbide Corp., twenty 20,000 gallon tankcars, to General American Transportation Corp., Chicago.

North American Car Corp., fifty 90-ton hoppercars, to Pullman-Standard Div., Pullman Inc., Chicago, and 123 piggyback flatcars, with 73 going to Pullman-Standard, and 50 to American Car & Foundry Div., ACF Industries Inc., New York.

Missouri Pacific, ten baggage-express cars to American Car & Foundry Div., ACF Industries Inc., New York. These are in addition to one hundred 70 ton boxcars which the road is building in its own shops.

Iron Ore Statistics—July, 1960

STOCKS OF IRON ORE AT FURNACES AND DOCKS—JULY, 1960

(Gross tons)

At Furnaces:	——U. S. Ores—— L. Superior	Other	—Canadian Ores— L. Superior	Other	Foreign Ores	Total
Start of month	24,809,618	3,792,288	1,007,935	3,528,719	13,957,973	47,096,533
End of Month:						
Mass., N. Y.	2,747,851	44,021	48,245	194,057	322,371	3,356,545
Pennsylvania	6,851,335	388,530	27,695	164,017	6,314,033	13,745,610
Md., Va., W. Va.	252,649	3,472	.....	1,663,037	2,727,991	4,647,149
Ky., Tenn., Tex.	369,999	243,290	.....	346,019	125,605	1,085,361
Alabama	871	1,854,261	.....	129,208	3,372,704	5,357,044
Ohio	8,414,861	53,502	584,354	1,744,480	1,055,071	11,852,268
Indiana	6,114,312	9,339	513,932	.....	86,789	6,724,372
Illinois	3,950,124	39,337	35,671	.....	255,360	4,280,492
Mich., Minn.	2,983,854	.....	270,865	121,432	229,752	3,605,903
Colo., Utah, Calif.	.....	1,105,662	.....	.....	23,229	1,128,891
Undistributed	300	2,615	.....	.....	500	3,415
End month total	31,686,156	3,744,477	1,480,762	4,362,250	14,513,405	55,787,050
At U. S. Docks	2,492,322	.....	123,904	901,020	1,913,520	5,430,766
Total U. S.	34,178,478	3,744,477	1,604,666	5,263,270	16,426,925	61,217,816
At Canadian Furnaces	2,004,227	.....	130,383	258,720	32,942	2,426,272
Total U. S.-Can.	36,182,705	3,744,477	1,735,049	5,521,990	16,459,867	63,644,088

CONSUMPTION OF IRON ORE—JULY, 1960

(Gross tons)

In U. S.:	——U. S. Ores—— L. Superior	Other	—Canadian Ores— L. Superior	Other	Foreign Ores	Total
Mass., N. Y.	321,865	17,898	7,395	38,464	14,158	399,780
Pennsylvania	614,863	153,966	1,008	19,080	666,226	1,455,148
Md., Va., W. Va.	126,018	25,563	.....	298,189	334,999	784,769
Ky., Tenn., Tex.	42,150	65,621	.....	38,148	31,466	177,385
Alabama	.....	311,865	.....	.....	146,351	458,216
Ohio	697,412	28,169	50,069	142,276	87,504	1,005,430
Indiana	986,914	.....	76,520	.....	24,431	1,087,865
Illinois	394,312	14,917	6,968	.....	32,543	448,740
Mich., Minn.	553,159	.....	59,825	54,889	34,018	701,891
Colo., Utah, Calif.	.....	491,221	.....	.....	3,946	495,167
Undistributed	24	81	.....	.....	.....	105
In U. S.						
Blast furnaces	2,186,105	632,921	113,967	257,582	441,956	3,632,531
Steel furnaces	56,646	49,644	.....	10,819	327,263	444,372
Sintering	1,493,895	421,083	87,818	322,645	606,369	2,931,810
Miscellaneous	76	5,653	.....	.....	54	5,783
Total U. S.	3,736,722	1,109,301	201,785	591,046	1,375,642	7,014,496
In Canada						
Blast furnaces	214,818	.....	66,521	85,863	.....	367,202
Steel furnaces	2,730	.....	.....	12,772	3,854	19,356
Sintering	66,524	.....	19,818	25,928	.....	112,270
Miscellaneous	.....	.....	.....	.....	.....	.....
Total Canada	284,072	.....	86,339	124,563	3,854	498,828
Total U. S.-Can.	4,020,794	1,109,301	288,124	715,609	1,379,496	7,513,324

Data from American Iron Ore Association.

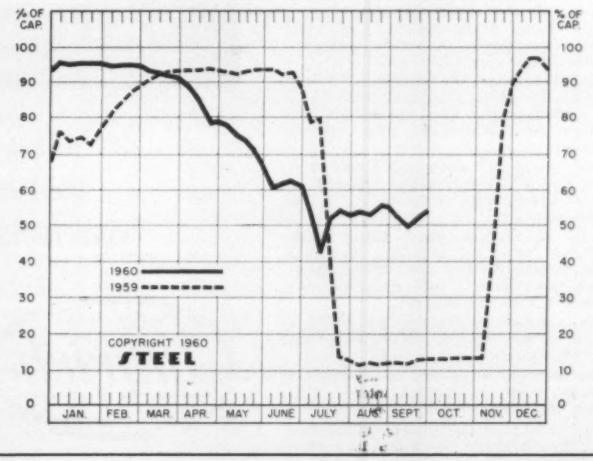
DISTRICT INGOT RATES

(Percentage of capacity utilized)

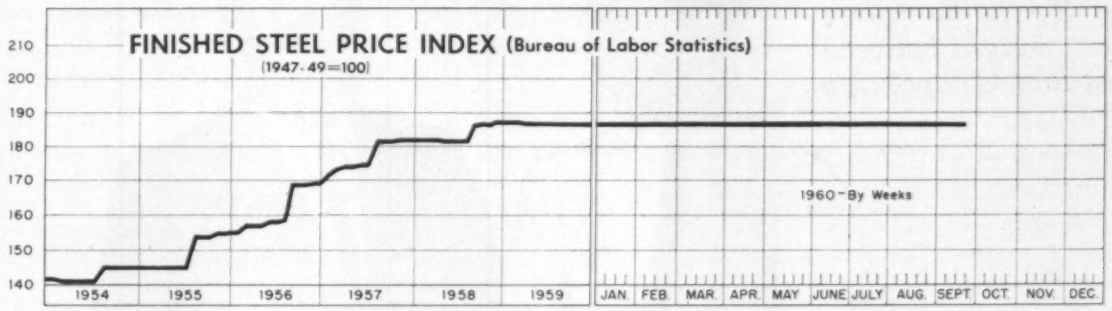
	Week Ended Sept. 25	Week Ago	Month Ago	Year Ago
Northeastern	60	58	60	*
Buffalo	58	59	58	*
Pittsburgh	42	42	45	*
Youngstown	45	43	45	*
Cleveland	55	48	50	*
Detroit	73	71	75	*
Chicago	62	62	58	*
Cincinnati	56	57	60	*
St. Louis	72	75	70	*
Southern	51	45	60	*
Western	51	53	53	*
Total Industry	53.9	53.0	54.3	12.8
Index (1947-49=100)	95.7	94.0	96.3	22.5
Net Tons (In thousands)	1,537	1,510	1,547	362

Current week's figures are preliminary. Weekly capacity (net tons): 2,849,306 in 1960 and 2,831,331 in 1959. Source: American Iron & Steel Institute. *Not available due to general strike.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Sept 20, 1960	Week Ago	Month Ago	Aug. Index	Year Ago
186.2	186.2	186.2	186.2	186.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Sept. 20

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, H.R., Carbon	6.675
Rails, Light, 40 lb	7.292	Bars, Reinforcing	6.335
Tie Plates	6.875	Bars, C.F., Carbon	10.710
Axles, Railway	10.175	Bars, C.F., Alloy	14.125
Wheels, Freight Car, 33 in. (per wheel)	62.000	Bars, C.F., Stainless, 302 (lb)	0.570
Plates, Carbon	6.350	Sheets, H.R., Carbon	6.350
Structural Shapes	6.167	Sheets, C.R., Carbon	7.300
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, Galvanized	8.775
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloys, High Speed, W18 Cr 4, V 1 (lb)	1.895	Strip, C.R., Carbon	9.489
Bars, H.R., Alloy	10.775	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Stainless, 303 (lb)	0.543	Strip, H.R., Carbon	6.250
		Pipe, Black, Buttweld (100 ft)	19.495
		Pipe, Galv., Buttweld (100 ft)	23.098
		Pipe, Line (100 ft)	195.430
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	27.005
		Tubing, Mechanical, Stainless, 304 (100 ft)	195.395
		Tin plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.665
		Bale Ties (bundles)	7.647
		Nails, Wire, 8d Common	9.433
		Wire, Barbed (80-rod spool)	8.414
		Woven Wire Fence (20-rod roll)	21.003

STEEL's FINISHED STEEL PRICE INDEX

	Sept. 21 1960	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	247.82	207.63
Index in cents per lb	6.713	6.713	6.713	6.713	5.625

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$149.96	$149.96	$149.96	$149.96	$127.41
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	58.99
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	58.49
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	59.77
Steelmaking Scrap, GT	32.00	32.33	32.67	41.00	44.33

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Sept. 21 1960	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.675	4.65
Bars, H.R., Chicago	5.675	5.675	5.675	5.675	4.65
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.975	4.90
Bars, C.R., Pittsburgh	7.65*	7.65*	7.65*	7.65*	5.90
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.50	4.60
Shapes, Std., Chicago	5.50	5.50	5.50	5.50	4.60
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.77	4.88
Plates, Pittsburgh	5.30	5.30	5.30	5.30	4.50
Plates, Chicago	5.30	5.30	5.30	5.30	4.50
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.30	4.50
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.30	4.50
Plates, Claymont, Del.	5.30	5.30	5.30	5.30	4.50
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.325
Sheets, H.R., Chicago	5.10	5.10	5.10	5.10	4.325
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.275	5.325
Sheets, C.R., Chicago	6.275	6.275	6.275	6.275	5.325
Sheets, C.R., Detroit	6.275	6.275	6.275	6.275	5.325-5.425
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.875	5.85
Strip, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.325
Strip, H.R., Chicago	5.10	5.10	5.10	5.10	4.325
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.425	6.25-6.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.425	6.35-6.45
Strip, C.R., Detroit	7.425	7.425	7.425	7.425	6.35
Wire, Basic, Pittsburgh	8.00	8.00	8.00	8.00	6.25
Nails, Wire, nonstock, Pitts.	8.95	8.95	8.95	8.95	7.60
Tin Plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.65	$9.05

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$99.50	$84.50
Wire rods, 7/32-5/8" Pitts.	6.40	6.40	6.40	6.40	5.025

PIG IRON, Gross Ton

	Sept. 21 1960	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$59.50
Basic, Valley	66.00	66.00	66.00	66.00	58.50
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	59.16
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	66.50	59.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	59.00
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	59.66
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	55.00
No. 2 Fdry (Birm.), deld., Cin.	70.20	70.20	70.20	70.20	62.70
Malleable, Valley	66.50	66.50	66.50	66.50	59.00
Malleable, Chicago	66.50	66.50	66.50	66.50	59.00
Ferromanganese, net tons†	245.00	245.00	245.00	245.00	190.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$30.50	$30.50	$31.50	$41.50	$43.50
No. 1 Heavy Melt, E. Pa.	35.00	35.00	35.00	41.00	46.50
No. 1 Heavy Melt, Chicago	30.50	31.50	31.50	40.50	43.00
No. 1 Heavy Melt, Valley	31.50	33.50	33.50	43.50	46.50
No. 1 Heavy Melt, Cleve.	29.50	31.50	31.50	39.50	44.00
No. 1 Heavy Melt, Buffalo	29.50	29.50	29.50	33.50	38.50
Rails, Rerolling, Chicago	52.50	53.50	53.50	62.50	64.50
No. 1 Cast, Chicago	39.50	40.50	42.50	55.50	47.50

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.00	$13.625
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.50
Oven, Fdry., Milwaukee	32.00	32.00	32.00	32.00	26.25

To the Executive caught between Cost and Competition . . .

Do you know how much can be saved by using Clad-Rex® vinyl-clad metals?

Here's why you should find out! Products can be fabricated of Clad-Rex with fewer operations than unfinished metals need. What's more . . . the added styling gives them much more sales appeal.

Clad-Rex vinyl-clad metals are "finished" when you get them. Therefore, the extensive metal treating and finishing needed for bare metal is not necessary. Further, the unusual abrasion resistance of Clad-Rex makes delicate handling unnecessary. This sharply reduces rejects, as well as expensive stripping and rework operations.

Clad-Rex vinyl-clad metals can be formed, drawn or worked much the same as bare metals! No special tooling or involved technique is required. Think of the savings you might get handling your raw material from the forming dies directly into assembly!

Incidentally, even though Clad-Rex is prefinished, you're not restricted to the usual limited choice of styling — color, texture and print in Clad-Rex vinyl-clad metals are almost unlimited.

High dielectric strength, corrosion resistance, workability, etc. . . . there's enough advantage that you should get the facts. See for yourself why Clad-Rex, which costs more than *un*finished metals, can make your end product cost less. Write today. No obligation, of course.

VINYL-METAL LAMINATES BY **CLAD-REX**® DIVISION OF SIMONIZ COMPANY

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11A

Steel Prices

Mill prices as reported to STEEL, Sept. 21, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 158; footnotes, page 160.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$76.00

INGOTS, Alloy (NT)
Detroit S41 ....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 ....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 ....82.00
Munhall,Pa. U5 ....82.00
Sharon,Pa. S3 ....82.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Bartonville,Ill. K4 ....$82.00
Bessemer,Pa. U5 ....80.00
Buffalo R2 ....80.00
Clairton,Pa. U5 ....80.00
Ensley,Ala. T2 ....80.00
Fairfield,Ala. T2 ....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 ....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2 ..80.00
Munhall,Pa. U5 ....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 ....80.00
Youngstown R2 ....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 ....99.50
Canton,O. R2 ....102.00
Clairton,Pa. U5 ....99.50
Conshohocken,Pa. A3..101.50
Ensley,Ala. T2 ....99.50
Fairfield,Ala. T2 ....99.50
Farrell,Pa. S3 ....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 ....99.50
Geneva,Utah C11 ....99.50
Houston S5 ....101.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2 ..99.50
LosAngeles B3 ....109.00
Midland,Pa. C18 ....99.50
Munhall,Pa. U5 ....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 ....109.00
Sharon,Pa. S3 ....99.50
S.Chicago R2, U5, W14..99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 ....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 ....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3 ..126.00
Detroit S41 ....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 ....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 ....119.00
Houston S5 ....124.00
Ind.Harbor,Ind. Y1 ....119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 ....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 ....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 ....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 ....119.00
S.Chicago R2,U5,W14..119.00
S.Duquesne,Pa. U5 ....119.00
Struthers,O. Y1 ....119.00
Warren,O. C17 ....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$122.50
Canton,O. R2 ....125.00
Cleveland R2 ....122.50
Gary,Ind. U5 ....122.50
S.Chicago,Ill. R2,W14..122.50
S.Duquesne,Pa. U5 ....122.50
Warren,O. C17 ....122.50

SKELP
Aliquippa,Pa. J5 ....5.05
Benwood,W.Va. W10 ....5.05
Ind.Harbor,Ind. Y1 ....5.05
Munhall,Pa. U5 ....5.05
Pittsburgh J5 ....5.05
Warren,O. R2 ....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 ....6.40
Alton,Ill. L1 ....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 ....6.40
Cleveland A7 ....6.40
Donora,Pa. A7 ....6.40
Fairfield,Ala. T2 ....6.40
Houston S5 ....6.65
IndianaHarbor,Ind. Y1 ..6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 ....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 ....6.50
LosAngeles B3 ....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 ....6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 ....6.50
S.Chicago,Ill. R2, W14..6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 ....6.50
Struthers,O. Y1 ....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ...5.50
Aliquippa,Pa. J5 ....5.50
Atlanta A11 ....5.70
Bessemer,Ala. T2 ....5.50
Bethlehem,Pa. B2 ....5.55
Birmingham C15 ....5.50
Clairton,Pa. U5 ....5.50
Fairfield,Ala. T2 ....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 ....5.50
Geneva,Utah C11 ....5.50
Houston S5 ....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 ....5.55
Joliet,Ill. P22 ....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 ....6.20
Minnequa,Colo. C10 ....5.90
Munhall,Pa. U5 ....5.50
Niles,Calif. P1 ....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 ....6.25
Seattle B3 ....6.25
S.Chicago,Ill. U5, W14 ..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 ....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 ....5.55
Clairton,Pa. U5 ....5.50
Fontana,Calif. K1 ....6.15
IndianaHarbor,Ind. I-2 ..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 ....5.50
Sterling,Ill. N15 ....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....6.90
Munhall,Pa. U5 ....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ....8.05
Bessemer,Ala. T2 ....8.05
Bethlehem,Pa. B2 ....8.10
Clairton,Pa. U5 ....8.05
Fairfield,Ala. T2 ....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 ....8.05
Geneva,Utah C11 ....8.05
Houston S5 ....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 ....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 ....8.75
Munhall,Pa. U5 ....8.05
Seattle B3 ....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 ....7.75
Struthers,O. Y1 ....8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ....8.10
Ind.Harbor,Ind. I-2 ..8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 ....8.05
S.Chicago,Ill. U5 ....8.05
Sterling,Ill. N15 ....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.55
Ind.Harbor,Ind. I-2 ..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 ....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 ....5.30
Ashland,Ky.(15) A10 ...5.30
Atlanta A11 ....5.50
Bessemer,Ala. T2 ....5.30
Clairton,Pa. U5 ....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 ....5.30
Coatesville,Pa. L7 ....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 ....5.30
Fairfield,Ala. T2 ....5.30
Farrell,Pa. S3 ....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 ....5.30
Geneva,Utah C11 ....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 ....5.40
Ind.Harbor,Ind. I-2, Y1..5.30
Johnstown,Pa. B2 ....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 ....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 ....5.30
Newport,Ky. A2 ....5.30
Pittsburgh J5 ....5.30
Riverdale,Ill. A1 ....5.30
Seattle B3 ....6.20
Sharon,Pa. S3 ....5.30
S.Chicago Ill. U5, W14 ..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 ....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 ....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 ....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.05
Fontana,Calif. K1 ....7.95
Geneva,Utah C11 ....7.05
Houston S5 ....7.15
Johnstown,Pa. B2 ....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....14.10

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ....7.95
Ashland,Ky. A10 ....7.95
Bessemer,Ala. T2 ....7.95
Clairton,Pa. U5 ....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 ....7.95
Coatesville,Pa. L7 ....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 ....7.95
Ecorse,Mich. G5 ....7.95
Fairfield,Ala. T2 ....7.95
Farrell,Pa. S3 ....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 ....7.95
Geneva,Utah C11 ....7.95
Houston S5 ....8.05
Ind.Harbor,Ind. I-2, Y1..7.95
Johnstown,Pa. B2 ....7.95
Munhall,Pa. U5 ....7.95
Pittsburgh J5 ....7.95
Seattle B3 ....8.85
Sharon,Pa. S3 ....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Sterling,Ill. N15 ....7.625
Warren,O. R2 ....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy
Aliquippa,Pa. J5 ....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L7 ....7.50
Economy,Pa. B14 ....7.50
Farrell,Pa. S3 ....7.50
Fontana,Calif. K1 ....8.30
Gary,Ind. U5 ....7.50
Houston S5 ....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 ....7.50
Lowellville,O. S3 ....7.50
Munhall,Pa. U5 ....7.50
Newport,Pa. A2 ....7.50
Pittsburgh J5 ....7.50
Seattle B3 ....8.40
Sharon,Pa. S3 ....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 ....7.50

FLOOR PLATES
Cleveland J5 ....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 ....6.375
Pittsburgh J5 ....6.375
S.Chicago,Ill. U5 ....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ...5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 ....6.05
Warren,O. R2 ....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ...5.675
Aliquippa,Pa.(9) J5 ...5.675
Alton,Ill. L1 ....5.875
Atlanta(9) A11 ....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ....5.675
Buffalo(9) R2 ....5.675
Canton,O.(23) R2 ....6.15
Clairton,Pa.(9) U5 ....5.675
Cleveland(9) R2 ....5.675
Ecorse,Mich.(9) G5 ....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 ....5.675
Houston(9) S5 ....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P2 ....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 ....6.375
Massillon,O.(23) R2 ....6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 ....5.825
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 ....6.375
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.125
Riverdale,Ill.(9) A1 ...5.675
Seattle(9) A24,B3,N15 .6.425
S.Ch'e'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5 .5.675
S.SanFran.,Calif.(9)B3 6.125
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ...5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11 .6.375
Warren,O. C17 ....6.025
Youngstown(9) R2,U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.725
Bethlehem,Pa. B2 ....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 ....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 ....6.725
Detroit S41 ....6.725
Economy,Pa. B14 ....6.725
Ecorse,Mich. G5 ....6.725
Fairless,Pa. U5 ....6.875
Farrell,Pa. S3 ....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 ....6.725
Houston S5 ....6.975
Ind.Harbor,Ind. I-2, Y1 6.725
Johnstown,Pa. B2 ....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 ....7.775
Lowellville,O. S3 ....6.725
Massillon,O. R2 ....6.725
Midland,Pa. C18 ....6.725
Owensboro,Ky. G8 ....6.725
Pittsburgh J5 ....6.725
Sharon,Pa. S3 ....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 ....6.725
Warren,O. C17 ....6.725
Youngstown U5 ....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ....8.30
Bessemer,Ala. T2 ....8.30
Bethlehem,Pa. B2 ....8.30
Clairton,Pa. U5 ....8.30
Cleveland R2 ....8.30
Ecorse,Mich. G5 ....8.30
Fairfield,Ala. T2 ....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 ....8.30
Houston S5 ....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 ....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 ....9.00
Pittsburgh J5 ....8.30
Seattle B3 ....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Sterling,Ill. N15 ....7.925
Struthers,O. Y1 ....8.30
Youngstown U5 ....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 ....5.925
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 ....5.775
Sterling,Ill.(1) N15 ...5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ....5.675
Atlanta A11 ....5.875
Joliet,Ill. P22 ....5.675
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 ....6.375
Pittsburgh J5 ....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 ....6.52
Seattle B3 ....6.125

BAR SIZE ANGLES; S. SHAPES Wrought Iron
Economy,Pa. B14 ....16.45

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.90
Houston S5 ....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 ....6.80
Youngstown U5 ....6.80

BARS, C.F. Loaded (including loaded extra)
Carbon
LosAngeles P2 S30 ...11.75*
Alloy
Ambridge,Pa. W18 ...10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 ....10.35
Chicago W18 ....10.175
Elyria,O. W8 ....10.175
Monaca,Pa. S17 ....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.5c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2..7.65
Birmingham C15 ....8.25
Buffalo B5 ....7.70
Camden,N.J. P13 ....8.10
Carnegie,Pa. C12 ....7.65
Chicago W18 ....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 ....7.65
Detroit S41 ....7.65
Donora,Pa. A7 ....7.65
Elyria,O. W8 ....7.65
FranklinPark,Ill. N5 ....7.65
Gary,Ind. R2 ....7.65
GreenBay,Wis. F7 ....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 ....8.15
Harvey,Ill. B5 ....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2..9.10
Manafield,Mass. R5 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 ....7.65
Monaca,Pa. S17 ....7.65
Newark,N.J. W18 ....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 ....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W19 ....8.20
Readville,Mass. C14 ....8.20
Seattle(49) S30 ....9.10
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 ....7.65
Warren,O. C17 ....7.65
Waukegan,Ill. A7 ....7.65
Willimantic,Conn. J5 ...8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19..8.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa.M12,R2 9.025
Bethlehem,Pa. B2 ....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 ....9.025
Camden,N.J. P13 ....9.30
Canton,O. T7 ....9.025
Carnegie,Pa. C12 ....9.025
Chicago W18 ....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 ....9.225
Detroit S41 ....9.025
Donora,Pa. A7 ....9.025
Elyria,O. W8 ....9.025
FranklinPark,Ill. N5 ..9.025
Gary,Ind. R2 ....9.025
GreenBay,Wis. F7 ....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 ....9.325
Harvey,Ill. B5 ....9.025
Lackawanna,N.Y. B3 ..9.025
LosAngeles P2, S30 ...11.00
Mansfield,Mass. B5 ....9.325
Massillon,O. R2, R8 ....9.025
Midland,Pa. C18 ....9.025
Monaca,Pa. S17 ....9.025
Newark,N.J. W18 ....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 ....9.20
Struthers,O. Y1 ....9.025

Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ....9.325
Youngstown F3, Y1 ...9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.25
Birmingham C15 .....5.25
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex.(26) T4...5.50
Gary,Ind. U5 .....5.675
Houston S5 .....5.675
Ind.Harbor,Ind. I-2,Y1.5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ....5.675
Kokomo,Ind. C16 ....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
SandSprings,Okla. S5 ..5.675
Seattle A24, B3, N14...6.425
S.Chicago,Ill. R2, W14.5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ....5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ...6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.35
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.35
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ...7.35
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ...7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 15.10
Economy,Pa.(D.R.)B14 19.30
Econ.(DirectRolled)B14 13.55
Economy(Staybolt)B14 19.80
McK.Rks.(S.R.) L5 ...14.50
McK.Rks.(D.R.) L5 ...19.80
McK.Rks.(Staybolt)L5. 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2.5.575
ChicagoHts.(4)(44) I-2.5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa.(3) F5 ....5.575
Franklin,Pa.(4) F5 ....5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 .....5.575
Tonawanda(3) B12 ....5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ....5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ....7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Aliquippa,Pa. J5 .....6.275
Allenport,Pa. P7 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ...6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(38) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(33) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	....
Fairfield,Ala. T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2..6.875‡
Ashland,Ky. A10 .....6.875‡
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10..6.875*
Middletown,O. A10 ..6.875†
Pittsburg,Calif. C11 ...7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 .....7.50
Youngstown J5 .....7.50

SHEETS, Well Casing

Fontana,Calif. K1 .....7.325

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625
Irvin,Pa. U5 (type 1)..9.525

SHEETS, Enameling

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
SparrowsPoint,Md. B2..6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel So.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke. Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co., Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E6 Empire-Reeves Steel
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div. Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.
M23 Mill Strip Products Co. of Pennsylvania

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons. John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Div., Bliss & Laughlin Inc.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J & L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America
S45 Somers Brass Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Wire Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 U. S. Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	5.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago,Ill. W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer Ala T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2, Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. W10	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, M23	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3, N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Cleveland A7	15.55
Carnegie,Pa. S18	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. S18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80
Weirton,W.Va. W6	10.80
Youngstown Y1	10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Anderson,Ind. G6	9.10	....	....	....	....
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	9.05	10.10	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, M23	8.95	10.10	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y. R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C.R., Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
NewCastle,Pa. M23	7.425*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.825
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9 35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.85
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per 100 lb)

Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30

ELECTROLYTIC THIN TIN PLATE (FERROLITE) (¼ lb coating in coils)

	Base Box			
	45 lb	50 lb	55 lb	60 lb
Fairfield, Ala. T2	$6.20	$6.35	$6.50	$6.65
Fairless,Pa. U5	6.20	6.35	6.50	6.65
Gary,Ind. U5	6.10	6.25	6.40	6.55
Irvin,Pa. U5	6.10	6.25	6.40	6.55

TIN PLATE,Hot Dipped 1.25 1.50 Common Coke	lb	lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65
Vandergrift,Pa. U5					8.10
Mansfield,O. E6					8.10
Warren,O. R2 (Silicon Lowcore)					8.10

SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	....	19.70	20.20	20.70 ....
Vandergrift,Pa. U5	..	17.10	18.10	19.70	20.20	20.70 15.70
Warren,O. R2	....	....	....	....	....	.... 15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
KansasCity,Mo. U3	12.90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
Kokomo,Ind. C16	9.85
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Millbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass.A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C16	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St. Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Tire Bead

	Col.
Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

WIRE, Cold-Rolled Flat

	Col.
Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	12.65
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock Sizes

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	173
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	175
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	179
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S Chicago,Ill. R2	173
Sparrows Pt.,Md B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7	$10.30

NAILS, CUT (100 lb kegs)

Wheeling,W.Va., W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	173
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	178
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill (7) N15	175
Worcester,Mass. A7	179

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$8 78
Atlanta A11	10.36
Bartonville,Ill. K4	8.88
Buffalo W12	10.26
Chicago W13	9 24
Crawfordsville Ind. M8	8.88
Donora,Pa. A7	8.78
Duluth A7	8.78
Fairfield,Ala. T2	8.78
Houston S5	10.51
Jacksonville,Fla. M8	8.88
Johnstown,Pa. B2	8.78
Joliet,Ill. A7	8.78
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	8.88
LosAngeles B3	9.44
Minnequa,Colo. C10	9.02
Pittsburg,Calif. C11	9.44
S Chicago,Ill. R2	8.78
S.SanFrancisco C10	9.94
SparrowsPt.,Md. B2	8.88
Sterling,Ill.(37) N15	8.88

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.06
Atlanta A11	10.70
Bartonville,Ill. K4	9.16
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.16
Donora,Pa. A7	9.06
Duluth A7	9.06
Fairfield,Ala. T2	9.06
Houston S5	10.85
Jacksonville, Fla. M8	9.16
Johnstown,Pa. B2	9.06
Joliet,Ill. A7	9.06
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.16
LosAngeles B3	9.75
Minnequa,Colo. C10	9.30
Pittsburg,Calif. C11	9.75
S Chicago,Ill. R2	9.06
S.SanFrancisco C10	10.26
SparrowsPt.,Md. B2	9.16
Sterling,Ill.(37) N15	9.16

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.11
Atlanta A11	10.75
Bartonville,Ill. K4	9.21
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.21
Donora,Pa. A7	9.11
Duluth A7	9.11
Fairfield,Ala. T2	9.11
Houston S5	10 90
Jacksonville,Fla. M8	9 21
Johnstown,Pa. B2	9.11
Joliet,Ill. A7	9.11
KansasCity,Mo. S5	10.96
Kokomo,Ind. C16	9.21
LosAngeles B3	9.80
Minnequa,Colo. C10	9.35
Pittsburg,Calif. C11	9.80
S Chicago, Ill. R2	9.11
S.SanFrancisco C10	10 31
SparrowsPt., Md. B2	9 21
Sterling,Ill.(37) N15	9.21

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	212
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
S SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	192
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa Pa. J5	190§
Atlanta A11	197*
Bartonville,Ill. K4	199
Crawfordsville Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	193**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen Pa P7	196§
Pittsburg,Calif. C11	213†
Rankin Pa. A7	193†
S.Chicago,Ill. R2	192**
S SanFrancisco C10	213*
SparrowsPoint,Md B2	198§
Sterling,Ill.(7) N15	198

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	191*
Bartonville,Ill. K4	193
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210*
Rankin Pa. A7	187†
S Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Ali'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Crawfordsville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	18.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.95	19.50†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.95	19.80
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	9.60 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48) A11	9.00 9.75*
Bartonville(48) K4	9.85 19.90
Buffalo W12	9.00 9.55†
Cleveland A7	9.00 ....
Crawfordsville M8	9.10 9.80††
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9 55†
Fairfield T2	9.00 9 55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80‡‡
Johnstown(48) B2	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
KansasCity(48)S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9 95 10 625§
Minnequa C10	9.25 9.80**
Monessen(48) P7	8 65 9 35§
Palmer,Mass. W12	9 30 9.95†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9.10 9.775§
St'ling(37)(48)N15	9.10 9.80
Struthers,O. Y1	9.00 9 65†
Worcester,Mass.A7	9.30 9.85†

Based on zinc prices of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Consumer discounts per cent off list prices, orders for 1 container for assorted sizes; for less than container quantities, add 25 per cent; attaching nuts to bolts, package sizes, add 7.5 per cent; heavy hex nut 1¼ in. through 1½ in. tapped 8 threads, add 10 per cent)

HEX HEAD CAP SCREWS, coarse, or fine thread, packaged or bulk, with or without hex nuts. 1020 steel bright and high carbon heat treated. ¼ in. thru 1 in. diam., listed lengths:

Plain Finish	50
Hot Galvanized and Zinc Plated:	
Packaged	43.75
Bulk	50

BOLTS Standard stock sizes:

Plain Finish	50
Hot Galvanized and Zinc Plated:	
Packaged	43.75
*Bulk	50

*Hot galvanized or zinc plated lag bolts only — for package or bulk quantities use apolicable list less bulk discounts.

HEXAGON NUTS, American Standard: Finished hex, hex jam, and hex slotted coarse or fine thread. ¼ in. through 3 in., finished hex thick, thick and slotted, castle, fine thread. ¼ in. through 1½ in., semifinished hex heavy, heavy and jam, heavy and slotted, coarse thread, ¼ in. through 4 in., and

SQUARE NUTS, American Standard: Regular square and heavy square, coarse thread, ¼ in. through 2 in.:

Plain Finish	50
Hot Galvanized and Zinc Plated:	
Packages	43.75
Bulk	50

CAP AND SETSCREWS,

Fillister Head, Cap Screws, Coarse Thread:

Packages	+55
Bulk	+16

Flat Head Cap Screws: ¾ in. and smaller, 6 in. and shorter:

Packages	+85
Bulk	+38

Setscrews, Square Head, Cup Point, Coarse Thread: Through 1 in. diam., 6 in. and shorter:

Packages	+ 5
Bulk	19

Through 1 in. diam., longer than 6 in.:

Packages	+29

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85

$\frac{7}{16}$ in. and smaller by 6 in. and shorter: 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Buffalo W12	$26.20	$38.50	$47.90	$61.30	$80.30
KansasCity,Mo. U3	26.20	38.50	47.90	61.30	80.30
Minnequa,Colo. C10	26.20	38.50	47.90	61.30	80.30
Pittsburg,Calif. C11	26.20	38.50	47.90	61.30	80.30
Roebling,N.J. R5	26.20	38.50	47.90	61.30	80.30
SparrowsPoint,Md. B2	26.20	38.50	47.90	61.30	80.30
St.Louis L8	26.20	38.50	47.90	61.30	80.30
Waukegan,Ill. A7	26.20	38.50	47.90	61.30	80.30

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut length 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2½	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	7.025

JOINTS BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

SCREW SPIKES

Lebanon,Pa. B2	15.10

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	15.35
Seattle B3	15.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2, Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in.; 6.70c; 1 15/16 to 3 in., inclusive, 7.05c.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(12) Worcester, Mass., base.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 5.65c.
(27) Bar mill sizes.
(28) Bonderized.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) 14 Ga., 48 in.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds and 2½ in. and smaller hexagons; 9.65c, for larger rounds and hexagons and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Youngstown Y1	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Alton, Ill. L1	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Benwood, W. Va. W10	1.5	+27	+10.5	+36	+21	+45.5	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Butler, Pa. F6	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+28	+7.75	+24	+4.25	+19.5	+1.75	+18.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+16	4.25	+12	7.75	+7.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sharon, Pa. S4	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sparrows Pt., Md. B2	2.5	+26	+10.5	+36	+21.5	+46	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Wheatland, Pa. W9	4.5	+24	+8.5	+34	+19.5	+44	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.75		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Alton, Ill. L1	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Benwood, W. Va. W10	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Etna, Pa. N2	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Fairless, Pa. N3	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Fontana, Calif. K1	+1.25	+17.25	+0.75	+16.75	0.75	+16.5	0.75	+16.5	+9.75	+27.5	+9.75	+27.5
Indiana Harbor, Ind. Y1	10.75	+5.25	11.25	+4.75	12.75	+4.5	12.75	+4.5	2.25	+15.5	2.25	+15.5
Lorain, O. N3	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Wheatland, Pa. W9	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Youngstown R2, Y1	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5

*Galvanized pipe discounts based on price of zinc at 13.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingot	Rerolling Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.35	46.75	42.35	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	.....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	39.50	40.50	44.25	46.75	45.75	52.00	52.00
304L	....	....	47.25	48.25	52.00	54.50	53.50	59.75	59.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	51.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.75	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	98.75	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Somers Brass Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates: 5% Carbon Base	Plates: 10% Carbon Base	Plates: 15% Carbon Base	Plates: 20% Carbon Base	Sheets: 20% Carbon Base
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	49.80	61.35	72.80	84.40	....
Nickel	43.20	55.05	66.95	78.90	....
Nickel, Low Carbon	43.50	55.70	67.95	80.35	....
Monel	44.25	55.35	66.45	77.60	....

	Strip, Carbon Base: Cold Rolled 10%	Strip, Carbon Base: Cold Rolled Both Sides
Copper*	36.80	44.20

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22; Coatesville, Pa. L7; New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	Hi-Carbon-Cr (D-11)	0.955
Spec. Carbon (W-1)	0.385	V-Cr Hot Work (H-13)	0.550
Oil Hardening (O-1)	0.505	W-Cr Hot Work (H-12)	0.530
V-Cr Hot Work (H-11)	0.506	W Hot Wk (H-21)	1.425-1.44

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.165
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.580

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

Prices in dollars per gross ton, f.o.b. (rail) furnace; add 50 cents when shipped by truck. Maximum delivered prices are approximate and based on rail shipment.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	66.50	....
Birmingham U6	....	62.50**	66.50	....
Woodward, Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda, N.Y. T9	....	66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester, N.Y., deld.	69.02	69.52	70.02	....
Syracuse, N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S. Chicago R2	66.00	66.50	66.50	67.00
S. Chicago, Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	Nom.	Nom.	Nom.	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Boston, deld.	75.20	75.70	76.20	76.70
Pittsburgh District				
Neville Island, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKees Rocks, Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	69.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa. deld.	68.60	69.10	69.10	69.63
Midland, Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield, Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
Granite City, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T3	62.00	62.50‡	66.50	67.00
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Calvert City, Ky. P15	$99.00
Niagara Falls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Fdry. K2	89.00
Keokuk, Iowa O.H. & Fdry. 12½ lb piglets, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Birdsboro, Pa. B10 (Phos. 0.075% max)	$73.00
Lyles, Tenn. T3 (Phos. 0.035% max)	73.00
Rockwood, Tenn. T3 (Phos. 0.035% max)	73.00
Buffalo H1 (Intermediate) (0.036-0.075% max)	71.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Neville Island, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Swedeland, Pa. A3 (Intermediate) (Phos. 0.036-0.075% max)	73.00
Troy, N.Y. R2 (Phos. 0.075% max)	73.00

Steel Service Center Products

Representative prices, cents per pound, f.o.b. warehouse, for 2000 lb items (except stainless) ordered by themselves. Prices will vary with total weight of the order or weight of the individual items or both. Base quantities for stainless sheets: 8000 lb, except in Chicago, New York, Boston, Los Angeles, and San Francisco, 10,000 lb. City delivery charges are 15 cents per 100 lb except: Denver, 20 cents; Baltimore, Boston, New York, Philadelphia, San Francisco, 10 cents; Atlanta, Birmingham, Dallas, Houston, Los Angeles, Seattle, no charge.

	SHEETS				STRIP	BARS			STRUCTURAL	PLATES	
	Hot Rolled	Cold Rolled	Galv.	Stainless Type 302	Hot Rolled	H.R. Rounds	C.F. Rounds	H.R. Alloy 4140	SHAPES	Carbon	Floor
Atlanta	9.37	10.61	11.83	....	10.85	9.53	13.24	....	9.94	9.73	11.16
Baltimore	8.27	8.66	10.06	....	8.28	8.95	11.80	16.38	9.53	8.84	10.43
Birmingham	9.43	10.20	10.46	....	10.41	8.26	13.14	16.76	8.47	8.41	10.05
Boston	9.67	10.58	11.77	53.50	12.16	9.77	13.35	16.59	10.16	9.62	11.08
Buffalo	8.65	9.80	11.25	55.98	11.00	8.75	11.45	16.30	9.15	8.65	11.10
Charlotte, N. C.	9.87	11.22	10.30	....	10.86	9.67	12.68	....	9.88	9.82	11.46
Chicago	8.57	10.20	10.15	52.00	10.74	8.55	10.65	15.95	8.91	8.41	10.68
Cincinnati	8.74	10.26	10.20	65.30	11.06	8.87	11.53	16.27	9.47	8.79	11.01
Cleveland	8.57	9.98	11.24	56.18	10.86	8.66	11.25	16.06	9.30	8.65	10.92
Dallas	9.62	10.43	12.59	....	11.18	9.03	12.98	16.95	9.26	9.35	11.00
Detroit	8.83	10.46	10.50	52.00	11.11	8.86	11.01	16.23	9.47	8.78	10.94
Denver	9.41	11.77	12.11	....	9.86	10.10	11.47	....	10.02	9.69	11.83
Houston	9.22	10.03	12.19	52.00	10.78	8.63	13.10	16.55	8.86	8.95	10.60
Indianapolis	9.01	10.64	10.59	....	11.18	8.99	11.09	16.39	9.35	8.85	11.12
Kansas City	9.21	10.87	11.35	....	10.87	9.31	11.57	15.72	9.80	9.10	....
Los Angeles	9.59	11.29	12.20	61.27	11.29	9.67	14.20	17.35	10.54	9.82	11.79
Memphis, Tenn.	9.84	10.05	....	....	11.24	9.92	12.74	....	10.33	10.12	11.41
Milwaukee	8.71	10.34	10.29	....	10.88	8.69	10.89	16.09	9.13	8.55	10.82
Moline, Ill.	9.24	10.70	11.45	....	10.90	9.34	11.15	16.45	9.83	9.17	10.96
Newark, N. J.	9.36	10.13	11.35	....	11.46	9.74	13.25	16.40	10.20	9.51	11.05
New York	9.36	10.13	11.35	52.98	11.46	9.74	13.25	16.40	10.20	9.51	11.05
Philadelphia	8.85	10.00	10.89	52.71	10.85	9.25	11.95	16.38	9.45	9.20	10.45
Pittsburgh	8.57	9.98	11.13	52.00	10.84	8.55	11.25	15.95	8.91	8.41	10.68
Portland, Oreg.	10.20	12.05	12.35	....	12.20	10.20	16.65	17.80	10.80	10.35	12.50
St. Louis	8.77	10.58	10.53	....	10.94	8.77	11.23	16.33	9.14	8.62	10.91
St. Paul	8.84	9.59	10.84	....	11.01	8.82	11.49	16.54	9.18	8.68	10.44
San Francisco	10.17	11.69	11.45	54.00	11.78	10.07	15.10	17.25	10.49	10.38	12.47
Seattle	10.51	11.57	12.50	54.02	11.95	9.94	16.20	17.80	10.65	10.10	12.73
Spokane, Wash.	10.36	11.42	12.35	54.02	11.80	9.79	16.20	17.80	10.50	9.95	12.58

Specifications: Hot rolled sheet, sheared edge, 10 Ga. & 36 x 96-120 in.; cold rolled sheets, 20 Ga. & 36 x 96-120 in.; galvanized sheets, 10 Ga. x 36 x 120 in. except Dallas and Houston, 10 Ga. x 48 x 120 in.; stainless, 16 Ga. x 36 in.; hot rolled strip, ⅛ in. x 1 in.; hot rolled carbon bars, rounds, ⅜ in.—1¼ in., M1020; cold finished bars, 1 in., C1018; hot rolled alloy bars, 4140 annealed, 1⅝ in.—2⅝ in. rounds; structural shapes, I beams, 6 x 12½ in.; carbon plates, sheared, through ½ in. x 84 in.; floor plates, ¼ in. x 36 in.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry-Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Vandalia, Mo., New Salisbury, Ohio, $97; Vanport, Pa., Wellsville, Irondale, Ohio, $100; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.00.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 straights.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $28-$28.50; barge, Brownsville, Tex., $30-$31.

Ores

Lake Superior Iron Ore

(Prices effective for the 1960 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Lump, ½ in. and up	12.85
Fines, under ½ in.	10.72
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1960, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates ..... nom.

Foreign Iron Ore

Cents per unit

Swedish basic, 65%, c.i.f. Atlantic ports	23.00†
Chilean, 62-65%, c.i.f. Atlantic ports	22.00
Brazilian, 68.5%, f.o.b. vessel, Victoria, per ton	$11.50

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$19.75-20.00
Domestic, concentrates, f.o.b. milling points	22.00-23.00

*Before duty. †Nominal.

Manganese Ore

Mn 46-58%, Indian, 85-90c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$34.00-35.00†
48% no ratio	25.00-26.00†

South African Transvaal

44% no ratio	18.75†
48% no ratio	24.00-26.00†

Turkish

48% 3:1	36.00-37.00†

Domestic

Rail nearest seller

18% 3:1	30.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked $1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.50-2.80
60-65%	2.80-3.20

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches—Diam	Inches—Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5½	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Metal Powder

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as noted.)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River: 100 mesh, bags .... 11.50 100 mesh, pails .... 9.85‡ 40 mesh, bags .....8.10††	
Electrolytic Iron,	
Melting stock, 99.9% Fe, irreg. fragments, ⅛ in. x 1.3 in. 28.75	
(In contract lots of 750 tons price is 22.75c)	
Annealed, 99.5% Fe..36.75, ton, del. east of Mississippi.	
Unannealed (99+% Fe)	33.0
Unannealed (99+% Fe) (minus 325 mesh) ..	58.0
Carbonyl Iron: 90-99.9%, 3 to 20 microns, depending on grade, 88.00-700.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 600-lb drum freight allowed, c.l.	39.80; ton lots 41.80
Brass, 80/20, leaded (60 mesh)	39.90
Bronze filter powder, 90/10	47.00*
Cobalt, 50 mesh	1.58
Copper, all types	15.25*
Lead	7.50*
Manganese, minus 35 mesh	1.00
Nickel, all types	0.78-1.06
Nickel-Silver	60.70
Solder	15.00*
Stainless Steel, 301	89.00
Stainless Steel, 316	$1.07
Steel, AISI 4650	32.00
Tin	14.00*
Zinc	25.90

Cobalt:	Dollars
98.5%, minus 100-300 mesh	1.57-1.58
99.5%, below 5 microns	2.32
Tungsten: Carbon and hydrogen reduced, 98.8% min., minus 65 mesh	nom.**
Molybdenum	4.35

*Plus cost of metal. ‡Depending on mesh. §Cutting and scarfing grades. **Depending on price of ore. ††Welding grade.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes*	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.75	....	$5.65	$5.50	$5.85
Bar Size Angles	5.95	....	5.85	5.70	6.05
Structural Angles	5.95	....	5.65	5.50	5.85
I-Beams	5.70	....	5.60	5.45	5.80
Channels	5.70	....	5.60	5.45	5.80
Plates (basic bessemer)	5.85	....	5.75	5.60	5.95
Sheets, H.R.	Nom.	....	Nom.	Nom.	Nom.
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	Nom.	....	Nom.	Nom.	Nom.
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	Nom.	....	Nom.	Nom.	Nom.
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.50	....	24.70	24.70	25.50
Barbed Wire (†)	6.25	....	6.15	6.00	6.35
Merchant Bars	5.95	....	5.85	5.70	6.05
Hot-Rolled Bands	6.20	....	6.10	5.95	6.30
Wire Rods, Thomas Commercial No. 5	6.40	....	6.20	6.20	6.60
Wire Rods, O. H., No. 5	6.55	....	6.35	6.35	6.70
Bright Common Wire Nails (§)	7.25	....	7.15	7.00	7.35

*Books closed for 1960-61 shipping season. †Per 82 lb net reel. §Per 100-lb keg, 20d nails and heavier.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Chattanooga, Tenn., ovens	30.80
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31 00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.68
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., Ovens	31.25

*Within $5 15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.	
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg.	6.00
Toluene, one deg. (deld. east of Rockies)	25.00
Cents per lb, f.o.b. tank cars or tank trucks, deld.	
Phenol, 90 per cent grade	14.75
Per net ton bulk, f.o.b. cars or truck, plant.	
Ammonium sulfate, regular grade	$32.00

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, 10 lb pigs, per gross ton, Palmerton, Pa. 21-23% Mn, $102.50. 19-21% Mn, 1-3% Si, $100; 16-19% Mn, $98. For Neville Island, Pa., prices add $2.50 as of Feb. 1. Lump 35 lb and down: Deduct $2 from 10 lb pig prices at Palmerton.

Standard Ferromanganese: (Mn 74-70%, C 7% approx) base price per net ton, $220. Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va., Ashtabula, Marietta, O.; Rockwood, Tenn.; Houston, Tex.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Min 79-81%). Lump $228 per net ton, f.o.b. Anaconda, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 4c for max 0.15% C grade from above prices, 5.3c for max 0.03% C, 6.6c for max 0.5% C, and 8.1c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 24c per lb of contained Mn; packed, carload 25.3c, ton lot 26.9c, less ton 28.1c.

Electrolytic Manganese Metal: Min carload, bulk, 34.25c; 2000 lb to min carload, 37c; less ton, 39c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 11.6c per lb of alloy. Packed, c.l. 12.8c, ton 13.25c, less ton 14.25c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Rockwood, Tenn.; Houston, Tex.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.3c from above prices. For 3% grade, Si 12.5-16% deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome: Cr 50-56%, C 6-8%, Si 4-7%, 22.00c; Cr 58-63%, C 5-8%, Si 3-6%, 22.50c per lb of contained Cr, carlots, lump, bulk, delivered.

Blocking Chrome: Cr 55-63%, C 4-6%, Si 8-12%, 23.50c per lb of contained Cr, delivered in carlots, lump, bulk.

Refined Chrome: Cr 53-63%, C 3-5%, Si 2.5% max., 26.00c per lb of contained Cr, delivered in carlots, lump, bulk.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 33.50c per lb contained Cr.; 0.010% max, 34.50c. Delivered.

Cr, 65-71%, carload, lump, bulk, 0.025% max, 35.00c; 0.05% max, 34.00c; 0.10% max, 33.75c; 0.20% max, 33.50c; 0.50% max, 33.25c; 1.0% max, 33.00c; 1.5% max, 32.75c; 2.0% max, 32.50c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload, bulk, 20.05c per lb of alloy carload packed 21.25c, ton lot 22.50c, less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr: 39-41%, Si 42-45%, C 0.05% max, 24.50c per lb contained Cr and 14.60c per lb contained Si; Cr 33-36%, Si 45-48%, C 0.05% max, 24.50c per lb contained Cr, 14.60c per lb contained Si; 0.75 in x down, 26.25c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (C 99.8% min, metallic basis Fe 0.2% max). Contract, carlot packed, 2" x D plate (above ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5 freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Chattanooga, Rockwood, Tenn.; Houston, Tex.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk, 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload, $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅜ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 13.7c per lb of briquet; c.l. packed, bags 14.9c; 3000 lb to c.l., pallets 14.9c; 2000 lb to c.l., bags 16.1c; less ton 17c. Delivered. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 14c per lb briquet; c.l. packed, bags 15.2c; 3000 lb to c.l., pallets 15.2c; 2000 lb to c.l., bags 16.4c; less ton 17.3c. Delivered. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 4% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (CB 44-77% approx, Ta 15% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots, $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carload, bulk 19.25c per lb of alloy, c.l. packed ⅛ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20% per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk, 19.25c. Packed c.l. 20.25c; 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (65-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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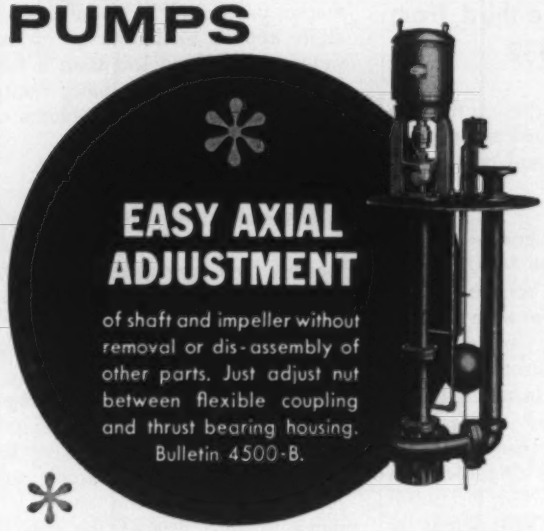

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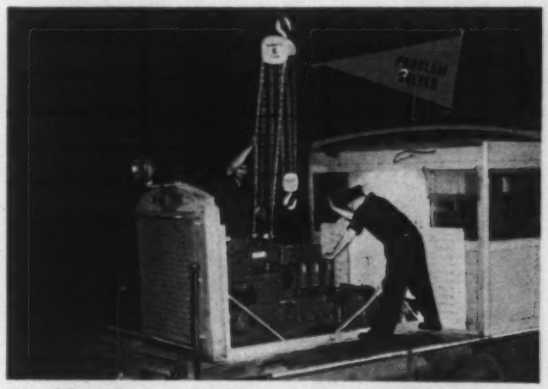

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60 C-3

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A product of
MANNING, MAXWELL & MOORE, INC.

Shaw-Box Crane & Hoist Division • Muskegon, Michigan
In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario

Japanese Place Big Scrap Order

Contracts awarded for about 560,000 tons to be shipped during last quarter. Tonnage down about one-third from previous purchase. STEEL's composite slips to $32

Scrap Prices, Page 168

• **Philadelphia** — Japanese buyers have closed on about 560,000 tons of scrap for shipment during the closing three months of this year. The tonnage is down about one-third from the last Japanese purchase. And prices were adjusted downward, mainly on No. 2 steel.

Export requirements in general appear to be easing. At the same time, domestic demand remains slack. However, prices are unchanged on most grades of steel scrap. The only exception is a decline of No. 2 bundles to $21, delivered. The cast iron grades are also easy; drop broken machinery is off slightly to $49-$50 delivered.

• **New York**—Brokers' buying prices are unchanged. Foreign demand is sustaining the market on the major steel grades. There's not enough business in borings and turnings to provide a test.

• **Pittsburgh**—The short term outlook is bad, and the long term is uncertain, brokers believe. Consumers are hesitant because of signs that the economy may be deteriorating. Brokers attribute the market's weak tone to these factors: 1. Reduced export demand. 2. Lack of support from mills that are booking less business for October than they anticipated. 3. Surplus of industrial scrap. 4. Willingness of collectors to unload scrap that they had been holding in the hope that prices would rise after Sept. 1.

• **Chicago**—Lack of scrap buying and the growing prospect that October steel production will be little if any better than September's have depressed prices about $1 a ton pretty well down the list. Leading mills indicate they are out of the market indefinitely. A similar situation applies to foundries. Most shops are working less than a full 48 hour week. They have scanty backlogs and a shrinking volume of new business.

• **Cleveland** — Substantial increases in steelmaking operations here and in the Youngstown area last week, sparked hope among district scrapmen that some representative purchases would soon be made by the mills. The ingot rate at Cleveland last week was up 7 points to 55 per cent of capacity, and at Youngstown it was up 2 points to 45 per cent. As has been the case for weeks past, prices are largely untested because of the small lots moving. Auto lists at the end of the month will point the way for prices over the next few weeks.

• **Youngstown**—Another decline of $1 to $3 per ton in scrap prices has

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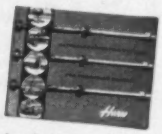

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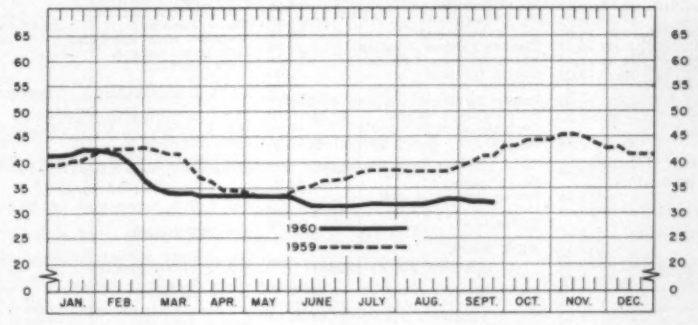

Sept. 21 1960	Week Ago	Month Ago	Year Ago	August Avg.
$32.00	$32.33	$32.67	$41.00	$32.33

hit this district. It reflects the lower buying prices by dealers from their suppliers; major steel producers who were expected to come into the market in September have indicated they won't buy then.

• **Detroit**—Dealers think prices on the new auto lists will go down $1 to $2 a ton. The mills have plenty of scrap, and dealers' yards are full. Auto plants will be offering considerably larger tonnages.

No orders are out currently in this district. There's some hope that prices may move up slightly as orders appear with the end of the Great Lakes shipping season nearing. Traditionally, however, local mills have tended to keep scrap inventories low in the last quarter to avoid high taxes.

• **Buffalo**—The market is dull and weak. Dealers report virtually no new business has been placed recently by the steel mills and foundries. Shipments are still being made on September orders; those will soon be cleaned up. Prices are unchanged; no change is expected soon since supplies are more than adequate to meet domestic demand. Some material is moving from this area for export.

• **Cincinnati** — Dealers forecast a drop in prices when industrial lists close this week. Brokers have lowered prices $1 a ton on shovel turnings, cast iron borings, and on several grades of cast.

• **St. Louis**—The market continues sluggish with demand spotty. The expected post-Labor Day pickup has not materialized, and prospects for an early improvement now seem dim. No. 1 cupola cast is quoted up $2 a ton at $43, clean auto cast is now holding at $44, and 18 in. and under rails at $42. Those changes are not seen as signaling any particular trend.

• **Birmingham**—Buyers are showing a little more interest in the cast iron grades. No. 1 cupola last week advanced $1 a ton to $48-$49. Electric furnace material (3 ft and under) is quoted $35-$36. Structurals and plates are up $1 to $38-$39.

• **Houston**—Demand for steel scrap is slow. One Texas mill is out of the market entirely; its operations are sharply curtailed. Another mill is operating sporadically, and a third one is only moderately active.

District scrapmen are pinning hopes for a late year pickup on demand from Japan. Export prices quoted at Beaumont, Tex., and in Baton Rouge, La., and New Orleans are still $1 above the domestic prices quoted on No. 1 and No. 2 heavy melting steel.

• **Seattle**—The local market is unchanged from a week ago. Domestic buying is limited and is mostly hand to mouth. Exporters are furnishing the only bullish factor. Scrap supplies are ample, and ac-

(*Please turn to Page* 173)

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UNIVERSAL GRINDING CORPORATION
2200 Scranton Rd., Cleveland 13, Ohio

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Sept. 21, 1960. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Sept. 21	$32.00
Sept. 14	32.33
Aug. Avg.	32.33
Sept. 1959	41.25
Sept. 1955	44.42

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	26.00-27.00
No. 1 dealer bundles	31.00-32.00
No. 2 bundles	25.00-26.00
No. 1 busheling	30.00-31.00
No. 1 factory bundles	38.00-39.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short turnings	20.00-21.00
Cast iron borings	19.00-20.00
Cut structurals:	
2 ft and under	37.00-38.00
3 ft and under	36.00-37.00
Heavy turnings	27.00-28.00
Punchings & plate scrap	39.00-40.00
Electric furnace bundles	37.00-38.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Stove plate	34.00-35.00
Unstripped motor blocks	25.00-26.00
Clean auto cast	37.00-38.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
Rails, 2 ft and under	50.00-51.00
Rails, 18 in. and under	51.00-52.00
Random rails	46.00-47.00
Angles, splice bars	45.00-46.00
Railroad specialties	45.00-46.00
Rails, rerolling	53.00-54.00

Stainless Steel Scrap

18-8 bundles & solids	175.00-180.00
18-8 turnings	95.00-100.00
430 bundles & solids	90.00-95.00
430 turnings	50.00-55.00

CHICAGO

No. 1 hvy melt., indus.	*31.00-32.00*
No. 1 hvy melt., dealer	*29.00-30.00*
No. 2 hvy melting	*27.00-28.00*
No. 1 factory bundles	*36.00-37.00*
No. 1 dealer bundles	*30.00-31.00*
No. 2 bundles	*19.00-20.00*
No. 1 busheling, indus.	*31.00-32.00*
No. 1 busheling, dealer	*29.00-30.00*
Machine shop turnings	*13.00-14.00*
Mixed borings, turnings	*15.00-16.00*
Shovel turnings	*15.00-16.00*
Cast iron borings	*15.00-16.00*
Cut structurals, 3 ft	*33.00-34.00*
Punchings & plate scrap	*35.00-36.00*

Cast Iron Grades

No. 1 cupola	*39.00-40.00*
Stove plate	*33.00-34.00*
Unstripped motor blocks	*31.00-32.00*
Clean auto cast	*44.00-45.00*
Drop broken machinery	*44.00-45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*33.00-34.00*
R.R. malleable	*43.00-44.00*
Rails, 2 ft and under	*46.00-47.00*
Rails, 18 in. and under	*47.00-48.00*
Angles, splice bars	*40.00-41.00*
Axles	*52.00-53.00*
Rails, rerolling	*52.00-53.00*

Stainless Steel Scrap

18-8 bundles, solids	*170.00-175.00*
18-8 turnings	*85.00-90.00*
430 bundles & solids	*80.00-85.00*
430 turnings	*40.00-45.00*

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	*16.00-17.00*
No. 1 bundles	26.00-27.00
No. 2 bundles	14.00-15.00
No. 1 busheling	22.00-23.00
Machine shop turnings	8.00-9.00
Mixed borings, turnings	10.00-11.00
Shovel turnings	11.00-12.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Stove plate	27.00-28.00
Heavy breakable	27.00-28.00
Unstripped motor blocks	19.00-20.00
Charging box cast	27.00-28.00
Clean auto cast	42.00-43.00

CLEVELAND

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	*21.00-22.00*
No. 1 factory bundles	*31.50-32.50*
No. 1 bundles	*29.00-30.00*
No. 2 bundles	17.00-18.00
No. 1 busheling	*29.00-30.00*
Machine shop turnings	*10.00-11.00*
Shovel turnings	*14.00-15.00*
Mixed borings, turnings	*14.00-15.00*
Cast iron borings	*14.00-15.00*
Cut foundry steel	*32.00-33.00*
Cut structurals, plate 2 ft and under	*35.00-36.00*
Low phos. punchings & plate	*29.00-30.00*
Alloy free, short shovel turnings	17.00-18.00
Electric furnace bundles	*31.00-32.00*

Cast Iron Grades

No. 1 cupola	*42.00-43.00*
Charging box cast	*31.00-32.00*
Heavy breakable cast	*28.00-29.00*
Stove plate	*37.00-38.00*
Unstripped motor blocks	*30.00-31.00*
Brake shoes	35.00-36.00
Clean auto cast	*47.00-48.00*
Burnt cast	*38.00-39.00*
Drop broken machinery	*48.00-49.00*

Railroad Scrap

R.R. malleable	45.00-46.00
Rails, 2 ft and under	*48.00-49.00*
Rails, 18 in. and under	*49.00-50.00*
Rails, random length	*42.00-43.00*
Cast steel	*36.00-37.00*
No. 1 railroad cast	*44.00-45.00*
Railroad specialties	44.00-45.00
Angles, splice bars	*45.00-46.00*
Rails, rerolling	53.00-54.00

Stainless Steel Scrap

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	165.00-170.00
18-8 turnings	75.00-80.00
430 clips, bundles, solids	85.00-90.00
430 turnings	20.00-30.00†

YOUNGSTOWN

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 busheling	*31.00-32.00*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	20.00-21.00
Machine shop turnings	*13.00-14.00*
Shovel turnings	*18.00-19.00*
Cast iron borings	*18.00-19.00*
Low phos.	*33.00-34.00*
Electric furnace bundles	*33.00-34.00*

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

BUFFALO

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	24.00-25.00†
No. 1 bundles	29.00-30.00
No. 2 bundles	21.00-22.00
No. 1 busheling	29.00-30.00
Shovel turnings	16.00-17.00
Machine shop turnings	12.00-13.00
Cast iron borings	14.00-15.00
Low phos. structurals and plate, 2 ft and under	37.00-38.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	40.00-41.00
No. 1 machinery	47.00-48.00

Railroad Scrap

Rails, random lengths	41.00-42.00
Rails, 3 ft and under	47.00-48.00
Railroad specialties	40.00-41.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	26.50-27.50
No. 2 heavy melting	22.50-23.50
No. 1 bundles	26.50-27.50
No. 2 bundles	17.50-18.50
No. 1 busheling	26.50-27.50
Machine shop turnings	9.00-10.00
Mixed borings, turnings	9.00-10.00
Shovel turnings	*12.00-13.00*
Cast iron borings	*12.00-13.00*
Low phos. 18 in.	35.00-36.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Heavy breakable cast	*30.00-31.00*
Charging box cast	35.00-36.00
Drop broken machinery	*47.00148.00*

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 18 in. and under	*49.00-50.00*
Rails, random lengths	*41.00-42.00*

PHILADELPHIA

No. 1 heavy melting	35.00
No. 2 heavy melting	31.00
No. 1 bundles	36.00
No. 2 bundles	*21.00*
No. 1 busheling	36.00
Electric furnace bundles	37.00
Mixed borings, turnings	17.00†
Shovel turnings	21.00
Machine shop turnings	15.00
Heavy turnings	25.00†
Structurals & plates	38.00-40.00
Couplers, springs, wheels	40.00
Rail crops, 2 ft & under	51.00-52.00

Cast Iron Grades

No. 1 cupola	39.00
Heavy breakable cast	40 00
Drop broken machinery	*49.00-50.00*
Malleable	46.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	21.00-22.00
No. 1 bundles	31.00-32.00
No. 2 bundles	16.00-17.00
Machine shop turnings	7.00-8.00†
Mixed borings, turnings	8.00-9.00†
Shovel turnings	9.00-10.00†
Low phos. structurals & plates	38.00-39.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	30.00-31.00

Stainless Steel

18-8 sheets, clips, solids	160 00-165.00
18-8 borings, turnings	80.00-85.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	70.00-75.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	26.00-27.00
No. 1 busheling	26.00-27.00
Machine shop turnings	6.00-7.00
Shovel turnings	9.00-9.50
No. 1 cast	39.00-40.00
Mixed cupola cast	30.00-30.50
No. 1 machinery cast	40.00-42.00

BIRMINGHAM

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	29.00-30.00
No. 2 bundles	20.00-21.00
No. 1 busheling	31.00-32.00
Cast iron borings	10.00-11.00
Machine shop turnings	17.00-18.00
Shovel turnings	19.00-20.00
Bar crops and plate	38.00-39.00
Structurals & plate	*38.00-39.00*
Electric furnace bundles	32.00-33.00
Electric furnace:	
3 ft and under	*35.00-36.00*
2 ft and under	35.00-36.00

Cast Iron Grades

No. 1 cupola	*48.00-49.00*
Stove plate	47.00-48.00
Unstripped motor blocks	35.00-36.00
No. 1 wheels	37.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
Rails, 18 in. and under	45.00-46.00
Rails, random lengths	39.00-40.00
Angles, splice bars	39.00-40.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	29.00
No. 2 heavy melting	27.00
No. 1 bundles	31.00
No. 2 bundles	19.00
No. 1 busheling	30 00
Machine shop turnings	7.50
Shovel turnings	9.50

Cast Iron Grades

No. 1 cupola	*43.00*
Charging box cast	36.00
Heavy breakable cast	34.00
Unstripped motor blocks	36.00
Clean auto cast	*44.00*
Stove plate	37.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00
Rails, random lengths	37.00
Rails, rerolling	51.00
Rails, 18 in. and under	*42.00*
Angles, splice bars	39.00

HOUSTON

(Brokers' buying prices; f.o.b. car)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 2 bundles	20.00-21.00
Machine shop turnings	nom.
Low phos. plate & structurals:	
3 ft	37.00
2 ft and under	40.00-41.00

Cast Iron Grades

No. 1 cupola	34.00-34.50
Heavy breakable	25.00
Foundry malleable	31.00†
Unstripped motor blocks	28.00-28.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00

LOS ANGELES

No. 1 heavy melting	*36.00*
No. 2 heavy melting	29 00†
No. 1 bundles	*33.00*
No. 2 bundles	*22.00*
Machine shop turnings	13.00-17.00†
Shovel turnings	15.00-17.00†
Cast iron borings	15.00-17.00†
Cut structurals and plate 1 ft and under	44.00†

Cast Iron Grades

No. 1 cupola	39.00-44.00†

Railroad Scrap

No. 1 R.R. heavy melt.	39.00†

PORTLAND, OREG.

(Prepared, f.o.b. car)

No. 1 heavy melting	36.00-39.00
No. 2 heavy melting	33.00-36.00
No. 2 bundles	20.00
Shovel turnings	15.00
Electric furnace bundles	48.00

Cast Iron Grades

No. 1 cupola	35.00
Heavy breakable	33.00
Unstripped motor blocks	33.00
Stove plate (f.o.b. plant)	20.00

SEATTLE

(Prepared, f.o.b. car)

No. 1 heavy melting	38.50
No. 2 (prepared for shears)	30.00
No. 1 hvy (unprepared)	35 00
No. 2 heavy melting	35.50
No. 2 hvy (unprepared)	33.00
No. 1 (prepared for shears)	33.00
No. 2 bundles	23.00
Shovel turnings	15.00
Electric furnace bundles	48.00

Cast Iron Grades

No. 1 cupola	35.00
Heavy breakable cast	36.00
Unstripped motor blocks	33.00
Stove plate (f.o.b. plant)	20.00

SAN FRANCISCO

No. 1 heavy melting	34.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	20.00
Machine shop turnings	14.00
Mixed borings, turnings	14.00
Cast iron borings	14.00
Heavy turnings	14.00
Shovel turnings	14.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices; net tons)

No. 1 heavy melting	25.50
No. 2 hvy melt, 2 ft & under	25.50
No. 1 bundles	25.50
No. 2 bundles	19.00
Mixexd steel scrap	16.00
Mixed borings, turnings	12.00
Busheling, new factory: Prepared	25.50
Unprepared	20.45
Shovel turnings	12.00

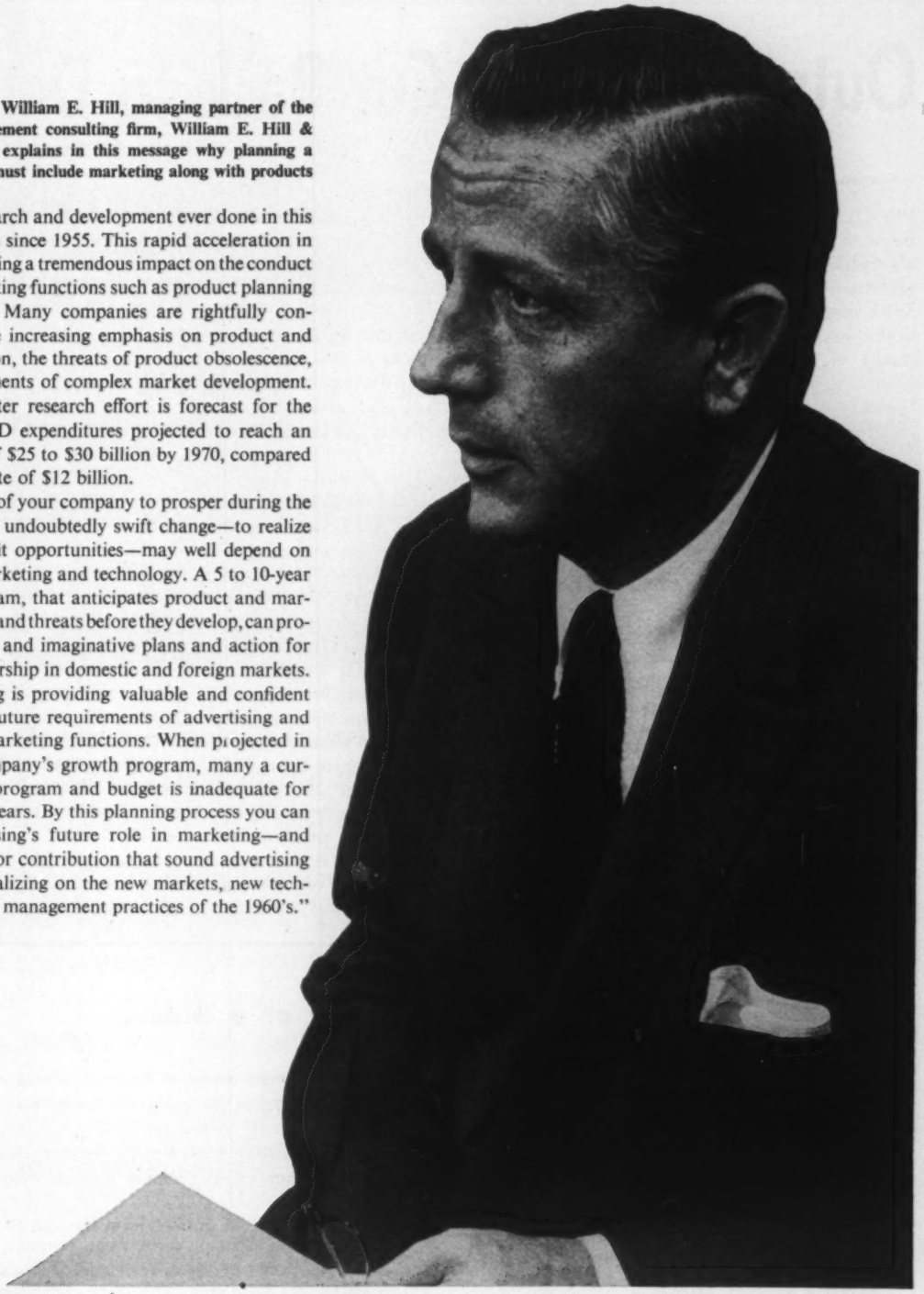
Cast Iron Grades‡

No. 1 machinery cast	43.00

†Nominal.

‡F.o.b. Hamilton, Ont.

"Long-range planning for advertising?"



"Certainly," says William E. Hill, managing partner of the New York management consulting firm, William E. Hill & Company, and he explains in this message why planning a company's future must include marketing along with products and processes.

"Half the research and development ever done in this country has been since 1955. This rapid acceleration in technology is having a tremendous impact on the conduct of specific marketing functions such as product planning and advertising. Many companies are rightfully concerned about the increasing emphasis on product and process innovation, the threats of product obsolescence, and the requirements of complex market development. And still a greater research effort is forecast for the 1960's, with R&D expenditures projected to reach an estimated level of $25 to $30 billion by 1970, compared with a present rate of $12 billion.

"The capacity of your company to prosper during the next ten years of undoubtedly swift change—to realize the period's profit opportunities—may well depend on your creative marketing and technology. A 5 to 10-year long-range program, that anticipates product and market opportunities and threats before they develop, can provide the advance and imaginative plans and action for competitive leadership in domestic and foreign markets.

"Such planning is providing valuable and confident insight into the future requirements of advertising and its companion marketing functions. When projected in relation to a company's growth program, many a current advertising program and budget is inadequate for the next 5 to 10 years. By this planning process you can optimize advertising's future role in marketing—and establish the major contribution that sound advertising can play in capitalizing on the new markets, new technologies and new management practices of the 1960's."

AIA

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An organization of over 4000 members engaged in the advertising and marketing of industrial products, with local chapters in ALBANY, BALTIMORE, BOSTON, BUFFALO, CHICAGO, CLEVELAND, COLUMBUS, DALLAS, DENVER, DETROIT, HAMILTON, ONT., HARTFORD, HOUSTON, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, MINNEAPOLIS, MONTREAL, QUE., NEWARK, NEW YORK, PHILADELPHIA, PHOENIX, PITTSBURGH, PORTLAND, ROCHESTER, ST. LOUIS, SAN FRANCISCO, TORONTO, ONT., TULSA, YOUNGSTOWN.

Output May Be Cut Back to Demand

Nonferrous Metal Prices, Pages 172 & 173

PRODUCTION curtailments may be on tap for some nonferrous metals unless sales perk up more than updated forecasts indicate they will. With demand in the U. S. running under earlier predicted levels, and stocks of most metals mounting, there's a better than 50-50 chance the fourth quarter will bring some curtailments.

That doesn't mean business is still going downhill. Quite the opposite. A modest sales gain was shown for most metals in August and they should do a little better in September. The difficulty is that a big chunk of U. S. production is geared at too high a rate for current demand.

If, and how soon, production cutbacks come will depend on political stability in major foreign producing areas (mainly the Congo) and the achievement of labor peace here and abroad.

• **Too Much Copper**—Even with continued strong demand in Europe, world production is geared at too high a rate if all facilities are producing under normal conditions, say metalmen.

Lead and zinc suffer from the same problem as copper—too much production for demand. That was pointed up earlier this month when the United Nations Lead & Zinc Study Group estimated that the lead surplus would run about 23,000 tons this year and 28,500 in 1961 and that the zinc surplus would be on the order of 81,000 tons this year and 112,000 tons next.

The UN group made no recommendation to change the status quo —zinc production will still be on an unrestricted basis and some nations will continue their voluntary curtailments of lead output.

While there's some doubt as to the accuracy of those figures in nonferrous circles, most metalmen agree production curtailments will come unless business picks up considerably. At present, such pressure is missing. Strikes are cutting back U. S. smelter production of zinc by about 16,000 tons a month. And lead smelter output will probably go down as stocks of ores and concentrates built up during the lengthy strike late last year and early in 1960 are completely worked off.

• **Aluminum Eyes Record**—The domestic aluminum industry will still set an all-time production record this year but it's entirely possible the fourth quarter may bring some modest cuts in output rather than an increase as was previously predicted. Over the last 90 days, potlines with an annual capacity of over 70,000 tons have been closed.

Again, it's not a question of lack of sales. Demand has already undergone a modest improvement and should get better in the fourth quarter, putting the year about on a par with 1959. The problem, as with the other metals, is that production has been based on demand forecast for 1960 that was too high.

Revere Cites Import Impact

Mincing no words, Chairman James M. Kennedy of Revere Copper & Brass Inc. spelled out the brass mill industry's plight to the U. S. Tariff Commission: ". . . Up to now the domestic brass mill industry has been sacrificed to the policy of free trade."

The three pronged result, says Mr. Kennedy: 1. The domestic industry has lost about 200 million lb of brass mill shipments. 2. Profits have been seriously hurt by the price reductions made by the mills to better compete with imports. 3. Imports have cost American labor 2857 jobs.

His solution: ". . . We should place temporary embargoes on all brass mill products entering this country; then give consideration to a quota system and to an increase in tariff rates sufficient to equalize the difference in labor and other pertinent costs."

Sums up Mr. Kennedy: "We would welcome foreign competition on an equal basis."

Price Outlook at a Glance

ALUMINUM	Slower than expected business should stymie producer's desire for across-the-board hike.
COPPER	Will probably go lower by yearend unless political and labor unrest continue to prop market.
LEAD	Should hold at present level through the year.
ZINC	Looks stable for next few weeks; lower term outlook cloudy.
NICKEL	Stable this year and next.
MAGNESIUM	No change in sight.

CONNORS special sections of Clark

Clark Ranger-700 Lifts Truck Trailer Load of New Cars — New Truck Can Lift 35 Tons.

"This Connors Special Section makes our upright the best built upright in the industry," says John G. Mack, Vice President of Purchasing, Clark Equipment Company.

"Connors special rolled steel sections permitted us to improve our design and provide an upright with just the proper weight distribution for the ultimate in strength," notes Mr. Mack.

"By utilizing these special, high quality sections, we have given our customers the best design with better wearing qualities and have also expedited our assembly, thereby increasing production efficiency."

Clark's Design Engineers needed an uneven leg, heavy channel section to work in conjunction with an "I" beam section in their lift truck mast assembly. Connors produced and hot rolled a special section designed to meet their rigid specifications — providing proper weight distribution and the ultimate in strength.

Investigate the advantages of special sections.

For illustrated brochure or consultation write or call Connors — Specialists in Special Sections
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CONNORS STEEL DIVISION **PORTER** ***H.K. PORTER COMPANY, INC.***

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, 50 lb ingots, 26.00, 30,000 lb or more, f.o.b. customer custody.

Aluminum Alloy: No. 13, 25.90; No. 43, 26.20; No. 195, 27.60; No. 214, 31.50; No. 356, 26.80. 50 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 25.50-26.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $70.00 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $65 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.50 per lb deld.

Cobalt: 99+%, $1.50 per lb for 500-lb keg; $1.52 per lb for 100 lb case; $1.57 per lb under 100 lb.

Columbium: Powder, $55-85 per lb nom.

Copper: Electrolytic, 33.00 deld.; custom smelters, 33.00; lake, 33.00 deld.; fire refined, 32.75 deld.

Germanium: First reduction, ingots, less than 1 kg, 36.00-37.50 per gram; 1-10 kg, 30.50-32.00 per gram; 10 kg or more, 28.10-29.99 per gram; intrinsic grade, under 10 kg, 31.95 per gram; 10 kg or more, 29.95 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-75 per troy oz nom.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis. New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 24 lb, $11 per lb deld.; 24-99 lb, $9.50; 100-499 lb, $9.25; 450 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.. 1.3 in. diam. x 12 in. sticks, 57.00 f.o.b. Madison, Ill.

Magnesium Alloy: AZ91A (diecasting), 40.75; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $208-210 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-8.5 in. diam., 50-4999 lb, $8.15-11.50 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, in kegs, 74.50; "F" nickel, 5 lb ingots, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-90 per troy oz nom.

Palladium: $24-26 per troy oz.

Platinum: $82-85 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $137-140 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $6.50-7 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom; sheet, $55 per lb nom.

Tellurium: $3.50-5 per lb, 100 lb or more.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 102.25.

Titanium: Sponge, 99.3+% grade A-1, ductile (0.3% Fe max.), $1.60 per lb; grade A-2 (0.5% Fe max.), $1.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $3.35-4.50.

Zinc: Prime western, 13.00; brass special, 13.25; intermediate, 13.00, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 14.35; special high grade, 14.50 deld. Diecasting alloy ingot No. 3, 16.25; No. 2, 16.75; No. 5, 16.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $8 per lb; 100-500 lb, $7 per lb; over 500 lb, $6.50 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.25-28.00; No. 12 foundry alloy (No. 2 grade), 23.75-24.25; 5% silicon alloy, 0.60 Cu max., 25.00-25.25; 13 alloy, 0.60 Cu max., 25.00-25.25; 195 alloy, 26.75-27.75; 108 alloy, 24.25-24.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.00; grade 2, 23.75; grade 3, 22.75; grade 4, 22.25.

Brass Ingot: Red brass, No. 115, 29.25; tin bronze, No. 225, 39.50; No. 245, 34.00; high-leaded tin bronze, No. 305, 33.75; No. 1 yellow, No. 405, 23.75; manganese bronze, No. 421, 28.25.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.25; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.975, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.955, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 38.35; l.c.l., 38.98. Weatherproof, 20,000-lb lots, 38.55; l.c.l., 39.30.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $6.75-15.50; sheared mill plate, $5.25-9.00; wire, $5.55-9.50; forging billets, $3.20-4.75; hot-rolled and forged bars, $3.80-6.25.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 28.00; ribbon zinc in coils, 22.50; plates, 21.50.

ZIRCONIUM

Plate, $14.00-25.00; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

(Selected products and sizes)

Flat Sheets: 1100, 3003, and 5005, mill finish, 30,000 lb base f.o.b. customer custody.

Thickness Range (in.)	Width (in.)	Length Range (in.)	Price Range
0.250-0.136	24-72	72-180	45.40-48.00
0.136-0.096	24-72	72-180	45.90-48.80
0.096-0.077	24-72	72-180	46.40-50.30
0.077-0.068	24-72	72-180	46.90-52.10
0.068-0.061	24-72	72-180	46.90-55.00
0.061-0.048	24-72	72-180	47.40-57.70
0.048-0.038	24-72	72-180	47.90-60.50
0.038-0.030	24-72	72-180	48.40-65.30
0.030-0.024	24-72	72-180	48.90-67.20
0.024-0.019	24-60	72-180	49.40-59.90
0.019-0.017	24-48	72-144	50.30-57.00
0.017-0.015	24-48	72-144	51.20-58.00
0.015-0.014	24-36	72-144	52.30
0.014-0.012	24-36	72-144	53.50
0.012-0.011	24-36	72-114	54.60
0.011-0.0095	24-46	72-144	56.20
0.0095-0.0085	24-36	72-96	57.50
0.0085-0.0075	24-36	72-96	59.20
0.0075-0.007	24-36	72-96	60.80
0.007-0.006	24-36	72-96	62.50

ALUMINUM (continued)

Plates and circles: Thickness, 0.25-3 in.; width or diam., 24-60 in.; lengths, 72-240 in., mill finish.

Alloy	Plate Base	Circle Base
1100, 3003-F	44.60	50.90
5050-F	45.70	50.50
3004-F	46.70	52.40
5052-F	47.30	53.10
6061-T6	47.80	53.90
2024-T4*	51.80	58.90
7075-T6*	60.50	67.90

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 base, 12 ft lengths

Diam (in.)*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	74.90	77.30	....	....
0.188	63.20	63.20	....	80.10
0.250	60.00	62.60	72.70	74.10
0.375	59.20	63.80	71.00	72.00
	2011-T3	2017-T451	2011-T3	2017-T451
0.500	59.20	63.80	71.00	72.00
0.625	59.20	63.80	67.80	67.90
0.750	57.70	62.00	61.60	63.80
0.875	57.70	62.00	61.60	63.80
1.000	57.70	62.00	61 60	63.80
1.125	55.30	59.50	59.50	61.50
1.250	55.30	59.50	59.50	61.50
1.375	55.30	59.50	59 50	61.50
1.500	55.30	59.50	59.50	61.50
1.625	53.00	56.70	....	59.30
1.750	53.00	56.70	58.30	59.30
1.875	53.00	56.70	....	59.30
2.000	53.00	56.70	58.30	59.30
2.250	51.50	55.00	....	59.30
2.500	51.50	55.00	....	59.30
2.750	49.90	53.20	....	59.30
3.000	49.00	53.20	....	59.30
3.250	....	53.20	....	....
3.375	....	53.20	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 47.50-57.60; 6061, 43.50-57.60; 7075, 61.80-71.90; 7079, 66.80-76.90.

Pipe: ASA schedule 40, alloy 6063-T6, 3-40 ft lengths, plain ends, 90,000 lb base, dollars per ft. Nominal pipe sizes: 1 in., 32.00; 1¼ in., 43.40; 1½ in., 51.80; 2 in., 62.60; 3 in., 124.90; 4 in., 171.80; 5 in., 233.15; 6 in., 308.55; 8 in., 464.35; 10 in., 716.25 (3-24 ft lengths).

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
1-14	45.30-46.80	54 00-60.00
15-17	45.30-46.80	56 50-61.90
18-23	45.80-47.50	58.60-67.60
24-32	45.80-47.50	66.80-81.50
33-38	49.50-52.20	85.10-96.60
39-44	59.80-63.60	102.00-124.00

MAGNESIUM

Sheets and Plates: AZ31B standard grade, .032 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.00 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.30; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.00 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	94.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-68.40	90.60-91.30
36-38	71.50-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire 23.00-23.50; No. 2 heavy copper and wire, 21.00-21.50; light copper, 19.00-19.50; No. 1 composition red brass, 18.00-18.50; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 33.00c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	57.13b	54.86c	....	58.32	29.000	29.000	28.250
Yellow Brass	50.57	36.06d	50.86	54.23	22.250	21.250	20.250
Low Brass, 80%	53.53	53.22	53.82	57.09	24.750	24.500	24.000
Red Brass, 85%	54.58	54.27	54.87	58.14	25.750	25.500	25.000
Com. Bronze, 90%	56.17	55.86	56.46	59.48	26.750	26.500	26.000
Manganese Bronze	58.86	52.21	62.69	....	20.750	20.500	20.000
Muntz Metal	53.20	48.26	....	....	20.875	20.625	20.125
Naval Brass	55.12	48.68	61.43	58.78	20.750	20.500	20.000
Silicon Bronze	62.86	61.80	62.15	80.79	28.375	28.125	27.375
Nickel Silver, 10%	65.98	68.06	68.06	....	26.875	26.625	13.437
Phos. Bronze	77.44	78.19	77.69	79.37	29.875	29.625	28.625

a. Cents per lb, f.o.b. mill; freight allowed on 50 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 16.50-17.00; new brass clippings, 15.00; light brass, 11.00-12.00; heavy yellow brass, 12.00-13.00; new brass rod ends, 13.00-13.50; auto radiators, unsweated, 13.00-13.25; cocks and faucets, 13.25-13.75; brass pipe, 14.00-14.50.

Lead: Soft scrap lead, 8.00-8.25; battery plates, 3.00-3.25; linotype and stereotype, 9.00-9.50; electrotype, 8.00-8.25; mixed babbitt, 9.50-10.00.

Monel: Clippings, 23.00-24.00; old sheets, 22.00-23.00; turnings, 16.50-17.50; rods, 22.00-23.00.

Nickel: Sheets and clips, 50.00-51.00; rolled anodes, 50.00-51.00; turnings, 39.00-41.00; rod ends, 50.00-51.00.

Zinc: Old zinc, 3.00-3.50; new diecast scrap, 4.25-4.50; old diecast scrap, 2.75-3.00.

Aluminum: Old castings and sheets, 10.00-10.50; clean borings and turnings, 5.25-5.50; segregated low copper clips, 12.00-13.00; segregated high copper clips, 11.50-12.00; mixed low copper clips, 12.00-12.50; mixed high copper clips, 11.00-11.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 8.50-9.00; segregated low copper clips, 15.50-16.00; segregated high copper clips, 14.00-14.50; mixed low copper clips, 13.00-13.50; mixed high copper clips, 12.50-13.00.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.00-11.25; clean borings and turnings, 9.50-10.00; segregated low copper clips, 14.75-15.00; segregated high copper clips, 13.50-14.00; mixed low copper clips, 14.00-14.25; mixed high copper clips, 13.50-14.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 59.00; light scrap, 54.00; turnings and borings, 39.00.

Copper and Brass: No. 1 heavy copper and wire, 26.75; No. 2 heavy copper and wire, 25.00; light copper, 23.25; refinery brass (60% copper) dry copper content, 22.75.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 26.75; No. 2 heavy copper and wire, 25.00; light copper, 23.25; No. 1 composition borings, 21.25; No. 1 composition solids, 21.75; heavy yellow brass solids, 16.50; yellow brass turnings, 15.50; radiators, 17.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.50.
Copper: Flat-rolled, 50.04; oval, 46.50, 5000-10,000 lb, electrodeposited, 42.00, 2000-5000 lb lots; cast, 44.50, 5000-10,000 lb quantities.
Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.
Tin: Bar or slab, less than 200 lb, 120.50; 200-499 lb, 119.00; 500-999 lb, 118.50; 1000 lb or more, 118.00.
Zinc: Balls, 20.50; flat tops, 20.50; flats, 23.25; ovals, 22.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.50 per lb in 100-lb drums.
Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.
Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,000 lb, 61.90.
Copper Sulphate: 100-1900 lb, 16.00; 2000-5900 lb, 14.00; 6000-11,900 lb, 13.75; 12,000-22,900 lb, 13.50; 23,000 lb or more, 13.00.
Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.
Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,900 lb, 28.50; 40,000 lb or more, 28.00.
Sodium Cyanide (Cyanobrik): 200 lb, 23.80; 400-800 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.
Sodium Stannate: Less than 100 lb, 79.50; 100-600 lb, 70.20; 700-1900 lb, 67.40; 2000-9900 lb, 65.60; 10,000 lb or more, 64.20.
Stannous Chloride (Anhydrous): 25 lb, 155.00; 100 lb, 150.10; 400 lb, 147.70; 800-19,900 lb, 106.80; 20,000 lb or more, 100.70.
Stannous Sulphate: Less than 50 lb, 140.20; 50 lb, 110.20; 100-1900 lb, 108.20; 2000 lb or more, 106.20.
Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 167*)
tive buying would bring substantial new tonnage to the market. Mill inventories are normal.

• **San Francisco**—There is no pressure on the market. Posted prices are largely nominal in the absence of active buying. Export prices vary from the published lists, several dollars a ton are being added at times when shipments are being rounded out.

• **Los Angeles**—Scrapmen are still negotiating contracts for fourth quarter Japanese requirements. It's reported the Japanese are asking for a $2 a ton cut in the price of No. 1 heavy melting.

Generally, it's felt that supply of No. 1 heavy melting is short and that prices will be forced upwards.

ICC To Hear Complaints On Scrap Freight Rates

The Interstate Commerce Commission will hold a hearing Oct. 4 on a freight rate case entered against 49 Eastern Territory railroads by the Institute of Scrap Iron & Steel and some 360 member companies. The complaint was filed with the ICC on Aug. 12.

The scrapmen petitioned the ICC to find that prevailing 80,000 lb rates on scrap iron are unjust and unreasonable and in violation of Sec. 1 (5) of the Interstate Commerce Act as amended. Reason: They exceed 70 per cent of the prevailing rates on manufactured iron and steel carload minimums of 80,000 lb.

Further, they ask that the ICC order the railroads to adopt a new scale of rates on scrap iron at 100,000 lb to be 50 per cent of the existing rates on 80,000 lb of new steel. They also ask that scrap iron rates be no greater than 150 per cent of the existing rates on iron ore.

Iron Ore . . .

Iron Ore Prices, Page 163

Republic Steel Corp. will reopen its mines at Lyon Mountain, N. Y., Oct. 3 on a limited scale. They have been closed since July 3. Much of the output is shipped to the Troy (N. Y.) Works so it appears likely that the Troy plant (closed since

CLASSIFIED

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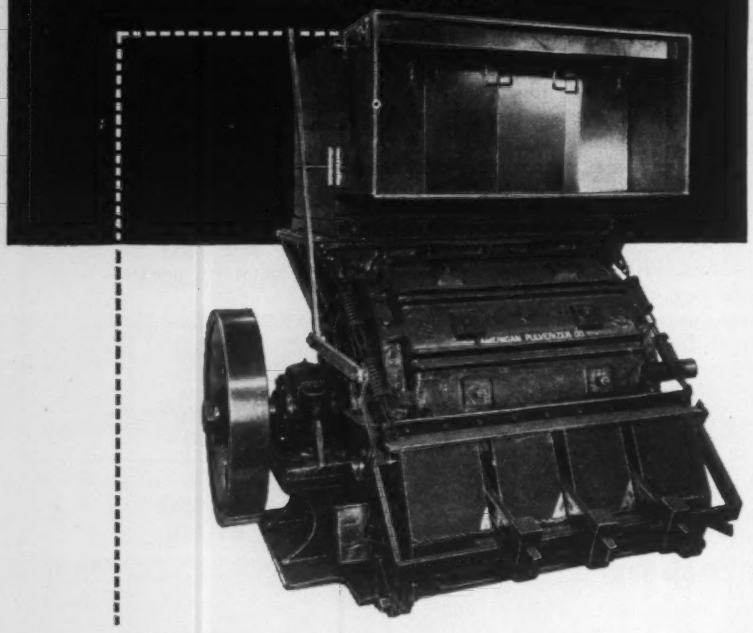

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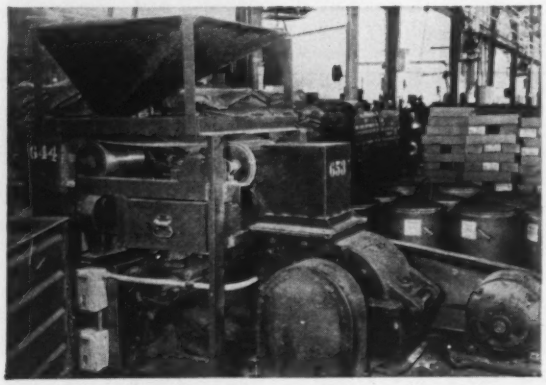

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June 30) also may be reopened soon.

Pig Iron . . .

Pig Iron Prices, Page 162

Some improvement is noted in merchant iron demand. Consensus in the trade is that demand will make further gains this month and that fourth quarter business will increase well above that for the current period.

Producers apparently are anticipating that trend. Hanna Furnace Corp., Detroit, has relighted a second blast furnace at Buffalo and is operating two out of four at that point.

Tennessee Coal & Iron Div., U. S. Steel Corp., has resumed partial operations at its Ensley, Ala., Works. Two blast furnaces were restored to operation Sept. 11; two open hearths, Sept. 18. The action was taken as a result of improvement in iron and steel demand. However, lack of rail orders (principal support of the Ensley Works) is delaying a full scale resumption of operations.

Blast Furnace Production Dips Slightly in August

Blast furnace production (pig iron and ferroalloys) declined slightly in August. Output was 4,497,108 net tons vs. 4,523,497 in the preceding month, reports the American Iron & Steel Institute. In August last year, output was only 947,779 net tons, being sharply curtailed by the steel strike.

Production in the first eight months this year was 50,594,828 net tons vs. 46,946,721 tons in the corresponding 1959 period. Production by states:

BLAST FURNACE PRODUCTION—AUGUST, 1960
(Net tons)

States:	August	First Eight Months
Massachusetts, New York	260,586	3,247,413
Pennsylvania	999,295	13,021,872
Maryland, Virginia, W. Virginia	482,587	4,769,517
Kentucky, Tennessee, Texas	125,619	1,247,549
Alabama	226,168	2,614,721
Ohio	777,981	9,163,644
Indiana	658,888	6,226,557
Illinois	312,655	4,043,883
Michigan, Minnesota	374,396	3,629,075
Colorado, Utah, California	278,933	2,630,597
Total	4,497,108*	50,594,828**

*Includes 27,603 tons of ferromanganese and spiegeleisen.
**Includes 480,147 tons of ferromanganese and spiegeleisen.
Data from American Iron & Steel Institute.

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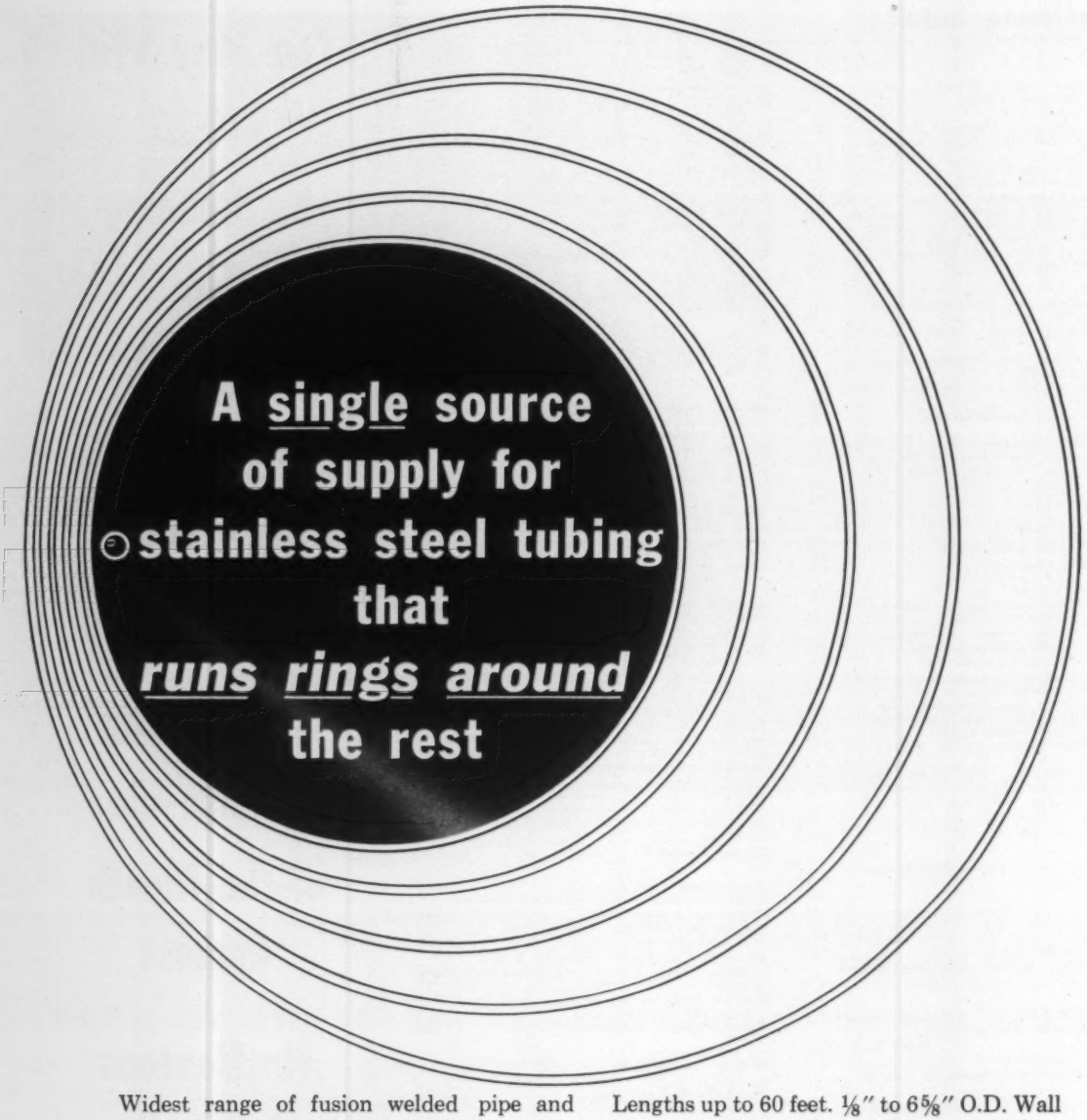

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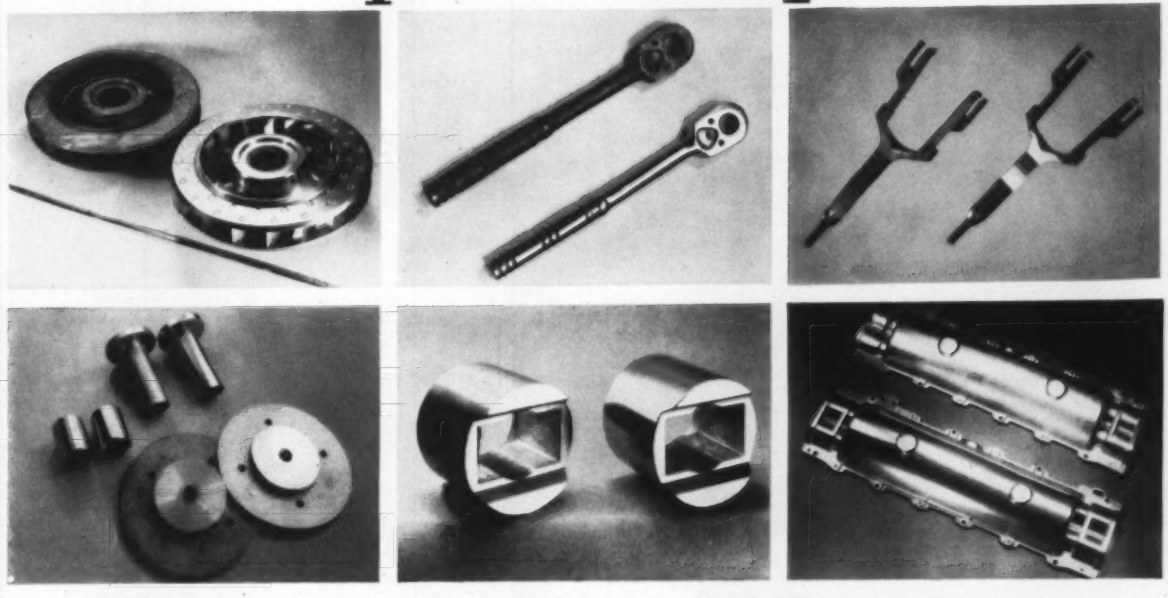

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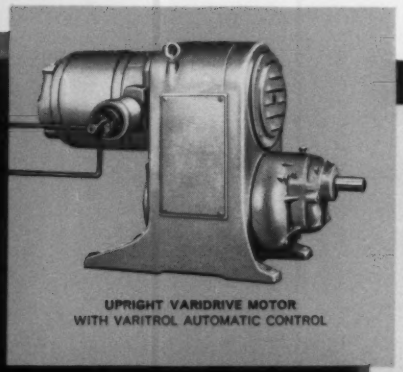

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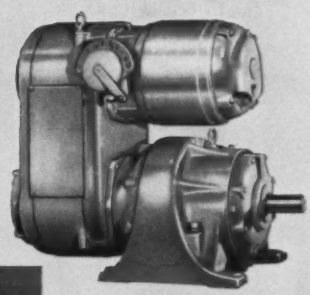

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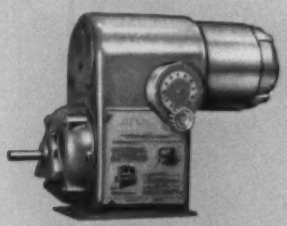

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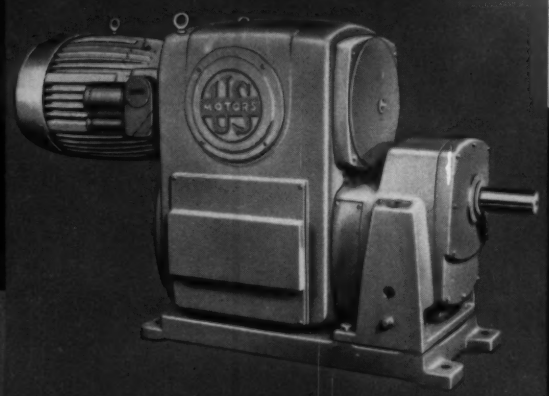

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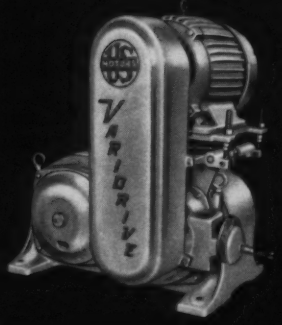

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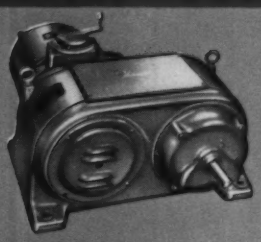

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